COMPARATIVE STUDY OF NARROW BAND-UVB ALONE VERSUS COMBINATION OF NARROW BAND-UVB WITH TOPICAL CLOBETASOL PROPIONATE 0.05% OINTMENT IN THE TREATMENT OF PSORIASIS VULGARIS

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ABSTRACT

INTRODUCTION:

Psoriasis is a chronic inflammatory disease.There are various treatment modalities to control the disease, which are used alone or in combination. Narrowband ultraviolet B has gained pace in the treatment of moderate to severe Psoriasis. Phototherapy alone or combined with systemic therapy or systemic therapy alone is recommended as the first-line therapy in moderate to severe Psoriasis Vulgaris . Hence,the efficacy and safety of Narrow Band -UVB the rapyversus Narrow Band-UVB with topical Clobetasol propionate 0.05%is assessed in patients with psoriasis vulgaris.

METHODS:

This prospective, observational study included 60 Patients diagnosed with Psoriasis Vulgaris who attended the Dermatology outpatient department at Vinayaka Missions Medical College,

Karaikal for a period of 6 monthswere included in the study.The diagnosis of psoriasis was made on clinical features & histopathological examination.In this,Study we comparedthe efficacy of Narrow Band -UVB versus Narrow Band -UVB with topical Clobetasol propionate 0.05% ointment.

RESULTS:

In our study,a total of 60 patients were included(where 30 patients received NB-UVB phototherapyand another 30 patients received NB-UVB along withClobetasol propionate 0.05%ointment)all thesepatients were followed every 4 weeks for 6 months in whichwe found a statistical significant difference in PASI score ($p < 0.05$) at 4 weeks,8 weeks and 12 weeks.The mean duration of treatment response was 11.4 weeks in the NB-UVB groupand 8.2 weeks in the combination group. The mean cumulative dose was 34.3 J/cm2 in the NB-UVB group and 21.5 J/cm^2 in the combination group.A combination of Clobetasol propionate 0.05% ointment and NB-UVB phototherapy is significantlymore effective than NB-UVB phototherapy alone in the treatment ofPsoriasisVulgaris. The addition of Clobetasol propionate 0.05% to NB-UVB phototherapy promotes fasterclearance of thelesions when compared with NB-UVB monotherapy.

Keywords: Psoriasis, NB-UVB, Clobetasol propionate 0.05%.

INTRODUCTION

Psoriasis Vulgaris is a chronic, inflammatory and proliferative disease. Psoriasis Vulgaris is the most common form of Psoriasis seen in approximately 90% of patients. Red, scaly, symmetrically distributed plaques are characteristically localized to the extensor aspects of the extremities, particularly the elbows and knees along with the scalp, lower lumbosacral, buttocks and genital involvement. Psoriasis Vulgarishas a strong genetic basis, characterized by complex alteration in epidermal growth, differentiation, multiple biochemical,

immunologic and vascular abnormalities. Several factors such as physical trauma, psychological stress, drugs[1] and infections may trigger the disease in a genetically predisposed individual[2]. Drugs with the strongest evidence in triggering the psoriasis disease are lithium, beta-blockers, antimalarials, non-steroidal anti-inflammatory drugs and tetracyclines.Stressed keratinocytes will release self DNA and RNA which form complexes with cathelicidin LL37, which cause plasmacytoid dendritic cells to produce interferon alpha thereby activating dermal dendritic cell. Activated dermal dendritic cell migrates to lymph node to present unknown antigen to naïve T cells and differentiation into T helper (Th)- 1, Th-17, Th-22 cells. This Th-1,Th-17,Th-22 migrate via lymphatic and blood vessels into psoriatic dermis , attracted by the keratinocyte-derived chemokines (CCL20, CXCL9-11, CCL17 and CCL27) which leads to formation of a psoriatic plaques. Activated T cells are believed to be the primary modulators in the pathogenesis of the psoriasis[3-4]. Th1 cells release IFN gamma and TNF alpha , causes inflammatory cascade , acting on keratinocytes and dDCs. Th17 cells secrete IL-17A and IL-17F which stimulate keratinocyte proliferation and release of beta -defensin and neutrophil-recruiting chemokines .Neutrophils infiltrate the stratum corneum and produce reactive oxygen species and alpha defensin .Th22 cells secrete IL-22 which induce further release of keratinocyte-derived T-cell recruiting chemokines .Inflammatory dendritic cells produce IL-23 ,nitric oxide radicle and TNF-alpha , natural killer T cells release TNF alpha and interferon gamma .Keratinocytes also release vascular endothelial growth factor(VEGF) ,angiopoietin thereby promoting neo angiogenesis, thusfurther perpetuates the keratinocyte injury creating a vicious positive feedback cycle.The hallmarks of psoriasis are hyperproliferation, abnormal differentiation of epidermal keratinocytes, infiltration of T lymphocytes and various endothelial vascular changes in the dermal layer, such as angiogenesis, dilatation, and high endothelial venue (HEV) formation. Psoriasis can be effectively controlled by various therapeutic options, used alone or in

combination[5].In, mild Psoriasisthe most commonly used therapy is topicals with the addition of phototherapy in refractory cases. In moderate to severe psoriasis, phototherapy alone, combined with systemic therapy or systemic therapy alone is recommended[5].Phototherapy uses natural or artificial light. The simplest and easiest form of phototherapy involves, exposing the skin to a controlled amount of natural sunlight.The source of NB-UVB is Philips TL-01 fluorescent bulbs that deliver UVB in the range of 310 to 315nm with a peak at 312nm. It has a relatively narrow spectrum of emission and results in a reduction in erythmogenic wavelengths in the 290 to 305nm rangeand 5 to 6fold increased emission of longer wavelengths, thereby resulting in a higher phototherapy index for psoriasis[6].Phototherapy can be combined with topical agents like anthralin, coal tar,corticosteroids , retinoids, emollients and salt water baths .Clobetasol propionate 0.05%ointment is a superpotent topical corticosteroids. Its mechanism of actions are anti-inflammatory , reduction in neutrophil recruitment , modulation of Langerhans cell activity , antiproliferative effects , antimotility effects, and vasoconstrictive properties .One of the FDA approved indicationsof topical corticosteroid is plaque psoriasis in patients of age18 years and above.Hence in this study NBUVBand NBUVBwith topical clobetasol propionate 0.05% ointmenthas been tried in the treatment of Psoriasis Vulgaris . A combination of treatment may provide a better treatment options, with early onset of action, while minimising the individual cumulative dose,risk and safety concerns that are present with higher dose in monotherapy.

MATERIALS AND METHODS

STUDY DETAILS

This is a hospital based prospective study conducted in the Department of Dermatology in Vinayaka Mission's Medical College and Hospital, Karaikal. The total sample size was 60 with the mean age of 41- 50 years included for total of 6 months. Patients wereenrolled after

applying exclusion and inclusion criteria.Patients were evaluated completely atthe first visit which included detailed history,clinical examination, laboratory workup and histopathological correlation.

Extent of lesion was assessed by Psoriasis Area and Severity Index (PASI).Baseline Investigations(Complete hemogram,ESR,CRP, Liver Function test and Renal Function Test ,Chest X-Ray,Hepatitis B and C) were done and were within normal limits. Hence we started the patients on NBUVB versus combination NBUVB with topical clobetasol propionate 0.05% ointment

	Thickness 0-4	**Scaling 0-4**	**Erythema 0-4**	**x Area 0-6**	**Total**
Head	a	b	c	d (a+b+c) x 0.1 = A	
Upper Limbs	e	f	g	h (e+f+g) x 0.2 = B	
Trunk	i	j	k	l (i+j+k) x 0.3 = C	
Lower limbs	M	n	o	p(m+n+o) x 0.4 = D	
					PASI = A+B+C+D

Table 1 – Psoriasis Area Severity Index (PASI)

Severity 0 = none Area 0 = no involvementAxillae = upper limb

1= mild1 = 0 <10%Neck/buttocks = trunk

2=moderate2= 10<30%Genito-femoral = lower limbs

3= Severe3=30<50%

4=very severe4= 50<70%

5= 70<90%

6=90<100%

INCLUSION CRITERIA

Inclusion criteria were patients with psoriasis vulgaris of duration more than 2 years , age between 19 and 50 years , PASI score more than 20. Patients with Psoriasis Vulgaris involving less than 20% body surface area included in this study.

EXCLUSION CRITERIA

Exclusion criteria were patients less than 18 years and more than 50 years of age, with photoallergy or polymorphic light eruption,PASI score less than 20, on photosensitizing agents or on medications negatively affecting psoriasis, guttate, erythrodermic, pustular or isolated palmoplantar psoriasis.Patients already treated with systemic therapy/PUVA within the previous 8 weeks, topical therapy/ UVB within past 4 weeks, pregnant and lactating women and with history of malignancies.

METHODOLOGY

60 patients with chronic plaque type of Psoriasis Vulgaris involving less than 20% of body surface area were randomly allocated to any one of the following 2 groups.

Group A- Narrow Band UVB phototherapy.

Group B- Narrow Band UVB with topical Clobetasol propionate 0.05% ointment.

GROUP A: NB-UVB GROUP

In this study 30 Patients were included in group A.All patients were given safety precautionsbefore entering the phototherapy unit.Men were advised to protect their genitalia.Patients were asked to apply liquid paraffin on the plaques of psoriasis before exposure.As all patients were of skin types IV and V the Initial dose of UVB was 260 mJ/cm^2.Patients were instructed to come out of the chamber when the light switches off or if it is unbearable during the treatment either due to burning sensation or pain over exposed area of the skin.Ifthe initial dose was tolerated, a subsequent 20% incremental dose was given at each subsequent visit depending on the patient's erythema response.Treatment was given thrice weekly on non-consecutive days.Patients were monitored regularly every

week.Patients were instructed to report immediately if any of the adverse effectslike erythema, burning, swelling, blistering over the site of lesion , pruritus, herpes simplex virus reactivation were noted .

GROUP B: NB-UVB WITH TOPICAL CLOBETASOL PROPIONATE 0.05% OINTMENT

In this study 30 patients were included in group B. Patients were advised to apply clobetasol propionate 0.005% ointment once daily at bedtime.Patients were instructed to apply a thin layer of the ointment over the psoriatic plaques.Patients received Narrow Band UVB phototherapy thrice weekly similar to patients in group A in addition to topical Clobetasol propionate 0.05% ointment once daily.Patients were monitored regularly every week.Patients were asked to report immediately if any of the above mentioned adverse effects were noted.

RESULTS

A total of 60 patients were included and randomised equally into two groups .The clinic-epidemiologic data of our study participants are depicted in table – 1 .Both the groups could be matched in all parameters except for weight and height

Table-1: Baseline characteristics of study participants

Parameters	**Group A (n=30)**	**Group B (n=30)**
Male(%)22 (73.3%)	22 (73.3%)	
Female(%)	8 (26.7%)	8 (26.7%)
Age(Years)36.03 +_ 12.97	37.77+_12.03	
Weight(Kg)54.83+_11.51	60.67+_12.58	
Height(Cm)159.46+_8.79	164.70+_8.15	

Duration of disease (Years)7.06+_6.12 5.06+_4.39

Family history4(13.3) 2(6.66)

Smoking5(16.7) 6(20)

Alcohol 5 (16.7) 4(13.3)

PASI (0 week) 18.26+_9.65 20.10+_10.33

Table2- shows the reduction of PASI scores from baseline, at 4 weeks, 8 weeks and 12 weeks in the group Aand group B.

Duration	**Mean PASI score**	
	Group A (NBUVB)	**Group B (NBUVB + Clobetasol propionate 0.05%)**
Baseline	12.01	11.60
4 weeks	7.60	5.12
8 weeks	4.20	2.01
12 weeks	2.40	0.46
Mean	6.55	4.79

GRAPH 1: Shows PASI reduction

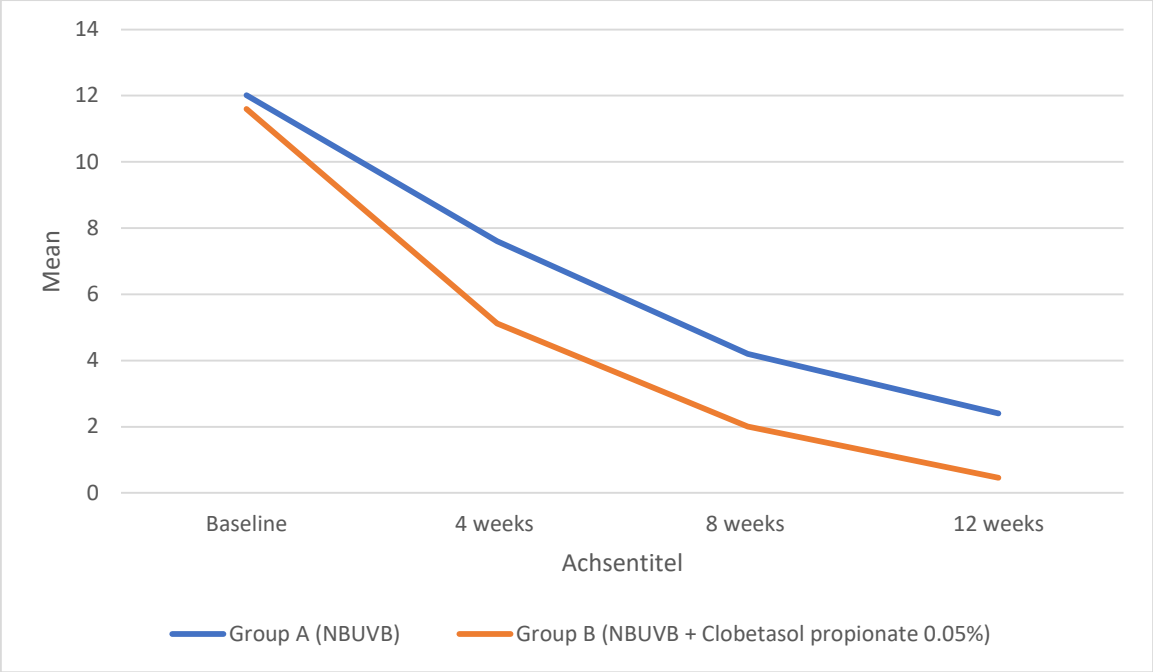
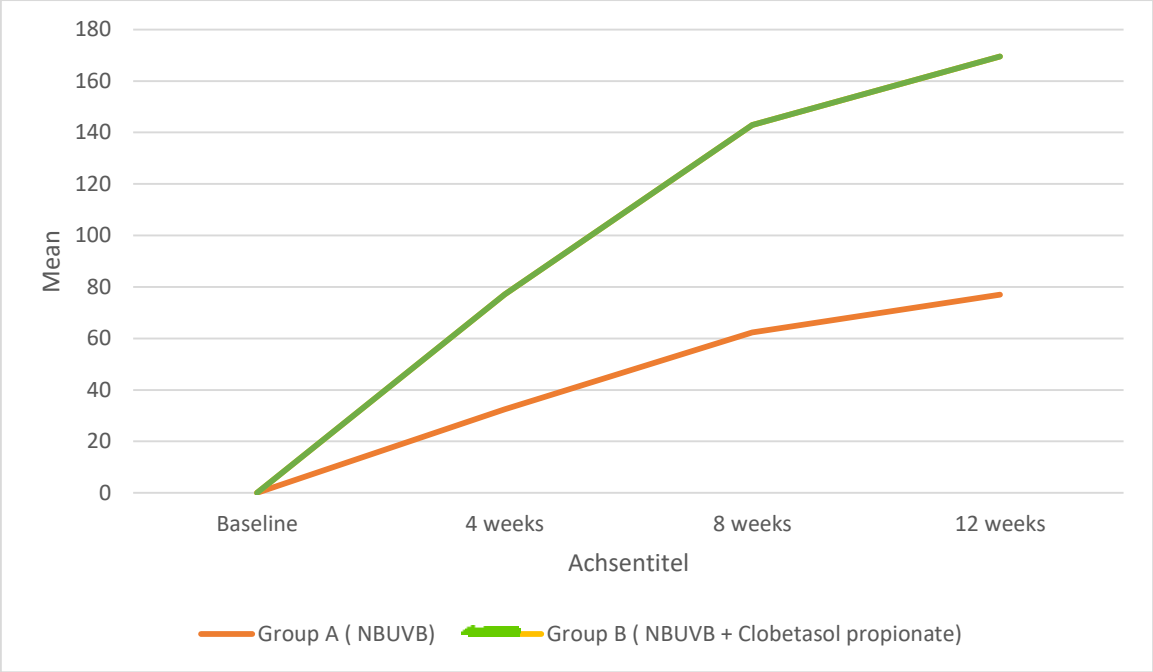


TABLE 3: Percentage reduction in PASI

Duration	**Mean PASI score (in percentage)**	
	Group A (NBUVB)	**Group B (NBUVB + Clobetasol propionate 0.05%)**
Baseline	0	0
4 weeks	32.52	44.57
8 weeks	62.30	80.63
12 weeks	77.01	92.52
Mean	42.95	54.43

GRAPH 2- Percentage reduction in PASI



From the above table-2, the mean baseline PASI scoresthe for NB-UVB group and Clobetasol propionate 0.05%combination group are 12.01 and 11.60 respectively.There is no statistically significant difference (p> 0.05) in baseline PASI among the NB-UVB group and Clobetasol propionate 0.05%combination group. At 4 weeks, PASI score has reduced to 7.60 and 5.12 respectively in the above-mentioned groups. From the above table -3, there is a 33.72% reduction in the NB-UVB group Awhereas 48.57% reduction in the Clobetasol group B. There is a further fall in PASI score at 8 weeks to 4.20and 2.01 in the group A and Clobetasol group B which corresponds to a reduction in percentages of 63.80% and 82.69%respectively.A further reduction of PASI score is observed at 12 weeks to 2.40 in the NB-UVB group which corresponds to a percentage reduction of 79.01% In the Clobetasol propionate 0.05% combination group, the reduction in PASI score is more rapid with a mean PASI score of 0.46 at 12weeks corresponding to a percentage of 94.62%. There is a statistically significant difference (p<0.05%) in PASI between NB-UVB and Clobetasol propionate 0.05% combination group at 4, 8 and 12 weeks

DISCUSSION

At present, phototherapy with narrow-band UVB is considered one of the most effective therapeutic modalities for patients with psoriasis. Many studieshave documented improved efficacy and therapeutic index for narrow-band UVB. However, the long-term sideeffectsnarrow-band UVB therapy have not been fully documented. As a result, there has been a great deal of interest in photo combination therapies that are capable of both reducing cumulative UVB doses and accelerating the resolution of skin lesions. Combination therapy helps in achieving higher clearance rates, longer disease free intervals and a lower carcinogenic risk.Clobetasol propionate has anti-inflammatory action, vasoconstrictive and anti-proliferative effects .Earlier studies reported that clobetasol propionate ointment used alone have better curative effects .Some studies shows NB-UVB can reduce CD4 cells, antigen presenting cells and function of activating T cells are suppressed . NBUVB is capable of more efficiently depleting skin infiltrating T cells from the epidermis and dermis of Psoriatic plaques as compared with BBUVB[7].The cumulative dose of the drug in combination of NBUVB with topical corticosteroids that is used as a rapid treatment is reduced, thus effectively reducing the side-effects .Many studieshave reported that narrow-band UVB therapy ismore effective than broad-band therapy for the management of psoriasis evenin children. Moreover, narrow-band UVB therapy iscomparable to PUVAphotochemotherapy in terms of its clinical effects and does not require post-treatment eye care or administration or photosensitizer[8-11].Stern et al reported topical corticosteroids in psoriasis appears produce, only modest beneficial effects, showing that topical corticosteroids in conjunction with UVB played a controversial role [12]. To gain our own experience, this study was designed to compare narrow-band UVB with a combination narrow-band NB- UVB and topical Clobetasol propionate 0.05%ointment in managing chronic plaque psoriasis. The results shows that NB-UVB combined with clobetasol

propionate 0.05% ointment had a higher curative effect than NB-UVB alone , and PASI score after the treatment were improved more significantly than the scores of the patients treated with NB-UVB alone.Our research revealed that clobetasol propionate 0.05% ointment combined with NB-UVB mayhave a synergistic role whichfastens the onset of action and increase therapeutic effect among the patients treated for Psoriasis Vulgaris compared to those who were treated with NBUVB alone .

CONCLUSION

From this study we found that topical corticosteroids can be used as an adjunct in Psoriasis patients on treatmentwith phototherapy. Topical corticosteroids are particularly useful forlocalized plaquesindifficult-to-treat areas, such as the lower extremities. A combination of topical Clobetasol propionate 0.05% with NBUVB appears to havesynergistic effects and reduces the cumulative doses of UVB andimproves the response of psoriasis to phototherapy. Thus,photocombination therapies can broaden the therapeutic options for thetreatment of patients with psoriasisvulgaris.

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