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Review Article

COMPARATIVE STUDY OF THE EFFICACY OF VARIOUS TOPICAL TREATMENT MODALITIES AND PHOTOTHERAPY FOR PSORIASIS VULGARIS: A REVIEW

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ABSTRACT

Psoriasis is a common, chronic, disfiguring, inflammatory and proliferative condition of the the skin. The psychological and social burden of psoriasis, plays a vital role in Quality of life of the suffering patient. Various forms of treatments are therefore available for psoriasis management including topical therapies, systemic therapies, phototherapy and biologics. The main objective of this review is to compare the efficacy of various topical modalities as well as phototherapy for psoriasis vulgaris. Several databases were searched for the relevant articles and these articles were critically analyzed to arrive at the conclusion that a combination of topical agents and NB UVB is very effective in the management of psoriasis vulgaris. Compared to the use of topical therapy alone, its combination with phototherapy has a better reduction of PASI score and is thus a better option.

Keywords: Psoriasis Vulgaris; Topical treatment; Calcipotriol; glucocorticoids; Phototherapy; PASI

INTRODUCTION

Psoriasis is a common, chronic, disfiguring, inflammatory and proliferative condition of the the skin, in which both genetic and environmental influences have a critical role. The most characteristic lesions consist of red, scaly, sharply demarcated, indurated plaques, present particularly over extensor surfaces and the scalp [i].The world wide burden of psoriasis is 2% and because of the psychological and social burden, it plays a vital role in the Quality of life of the suffering patients. For this reason, the proper management of psoriasis is essential to improve the quality of life of such patients. Various forms of treatment like topical therapies, systemic therapies, phototherapy and biologics which substantially differ in chemistry, route of administration, mechanism of action and adverse effects have been developed thus far. The various topical modalities available are coal tar, Anthralin, topical Glucocorticoids, salicyclic acid, Vit-D analogues like calcipotriol, tazarotene and topical cytostatic therapies like 5% flurouracil, Methotrexate to name a few. Systemic treatments include Methotrexate, Acitretin and cyclosporine; Biologics include Ustekinumab, Adalimumab, Etanercept, Infliximab [ii]. The treatment modality is chosen according to the type of disease. Psoriasis vulgaris(Plaque type psoriasis) is the most common type of the disease encountered in clinical practice and it can be managed with topical therapies and phototherapy. Fig 1 shows the typical sites of presentation of psoriasis vulgaris, note the symmetry of the lesions. Psoriatic arthritis and erythrodermic arthritis however, require systemic therapy. Among plaque type psoriasis patients, prevalence of nail psoriasis documented in the literature is over 50 %, with an estimated lifetime incidence of 80–90 % [iii]. A clinical practice guideline published by the ministry of health, Malaysia in 2013, categorized psoriasis as Mild (BSA <= 10% or PSI <= 10), Moderate (BSA >10% to 30% or PASI >10 to 20) and Severe (BSA >30% or PASI >20). The modality of treatment was to be chosen according to the severity of the disease. The algorithm of treatment of psoriasis according to the guidelines is given below (Fig. 2) [iv]. In this article, we will be reviewing literature related to the efficacy of topical treatments of psoriasis vulgaris, which is commonly known as chronic plaque psoriasis.

In all of the papers reviewed, Psoriasis Area and Severity index was used to assess the clinical efficacy of treatments given.

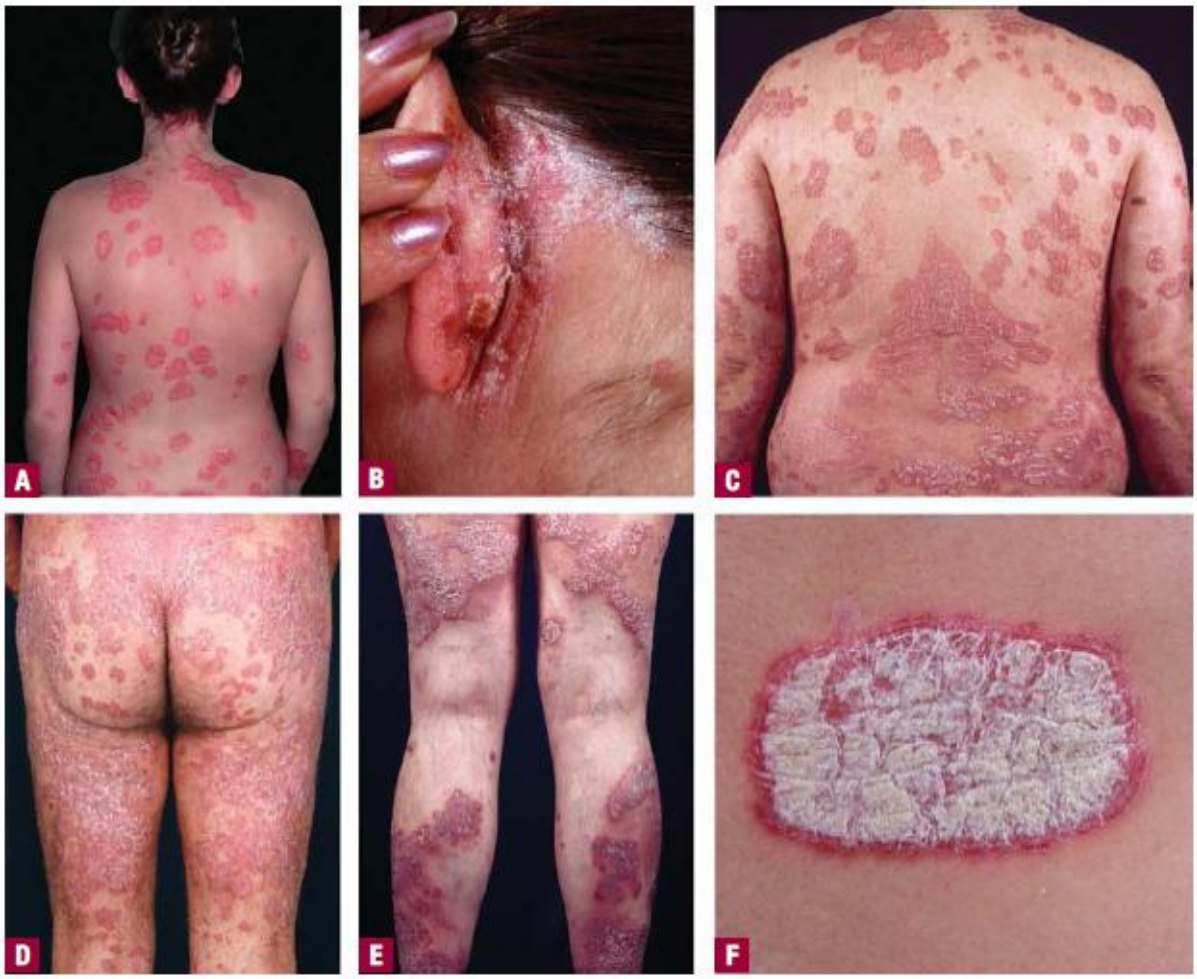

Figure 1: A-F show typical distribution of chronic plaque psoriasis. Note the symmetry of lesions.

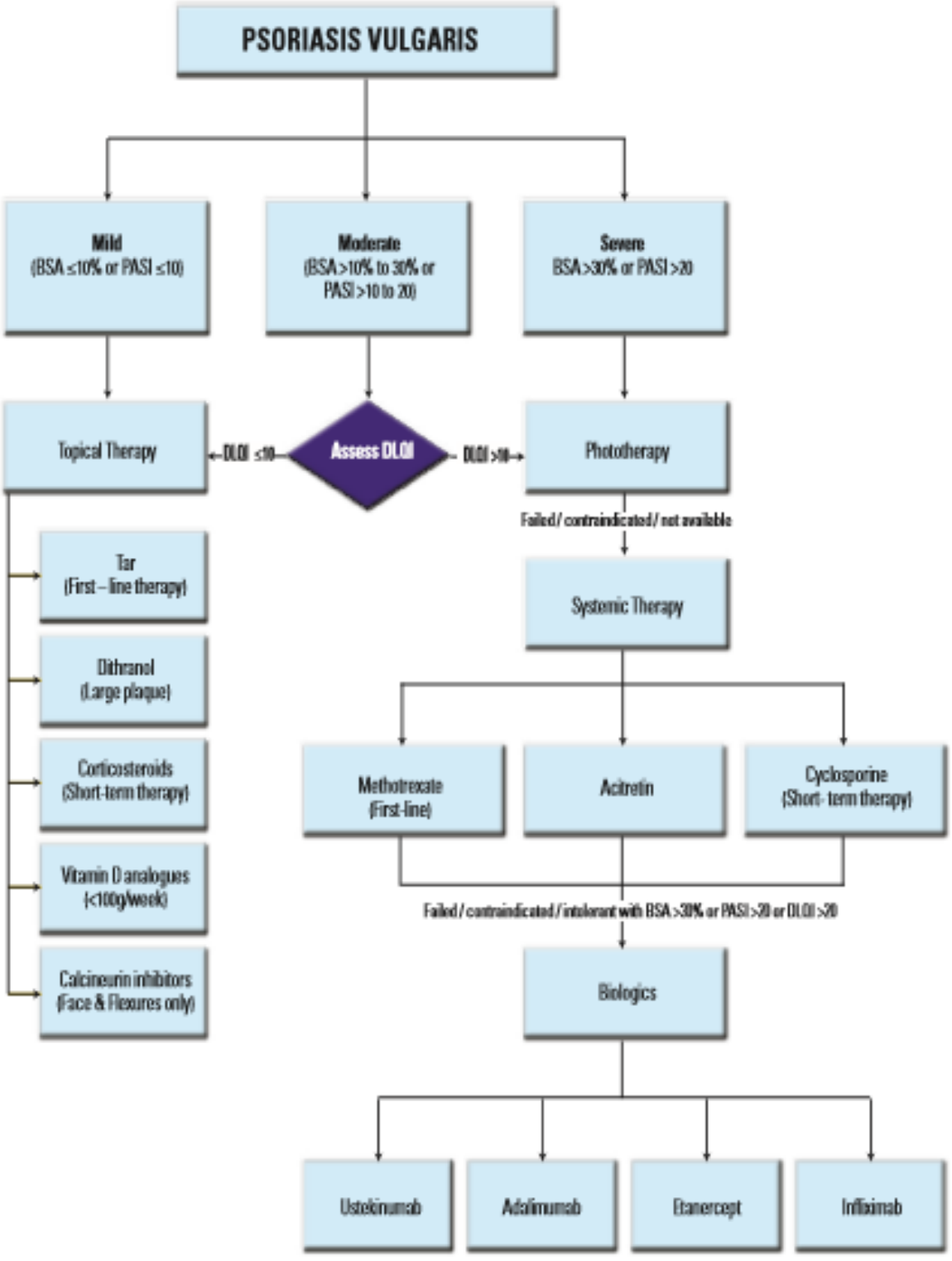

Figure 2: Table showing the algorithm of treatment of Psoriasis.

METHODS AND METHODOLOGY

A review of studies that investigated the efficacy of topical treatments of psoriasis was performed. Eligibility criteria included all studies published in English in various medical databases like Pub Med, EMbase, and Medline from 1986 to 2016. Articles were found using MESH terms: "Psoriasis Vulgaris" AND "Topical Therapy". Keyword searches were also used as a secondary search strategy to ensure all relevant articles were included. After completing the literature search, all the articles were critically analyzed to compare the efficacy of various treatments in Psoriasis Vulgaris.

RESULTS

After critically analyzing the reviewed articles, I have come to the following conclusions:

Psoriasis is a chronic disease that requires a long term maintenance strategy with an agent that has potent activity without any long term adverse effects. Therefore, choosing a treatment modality that has good clinical recovery and a minimal occurrence of side effects is mandatory to patient compliance and satisfaction.

In one of the studies, comparison of the efficacy between topical lipsomal dithranol, 1% betamethasone and liquid paraffin showed the following results:

Topical Agents	Baseline PASI	PASI at 4 weeks	PASI at 8 weeks	Excerbations	Side effects
Lipsomal Dithranol	5.36	1.97 (64% decrease)	0.97 (83% decrease)	Infrequent	Minimal
1% Betamethasone	4.82	1.76 (65% decrease)	0.93 (83% decrease)	Frequent	Moderate
Liquid Paraffin	4.23	3.97 (4% decrease)	3.94 (6% decrease)	Very frequent	Severe

Another study of six phase III studies comparing the efficacy of combination ointment of calcipotriol(50ug/g) and betamethasone dipropionate(0.5mg/g) showed 65% - 74.4% reduction in PASI at 4 weeks.

A study comparing the clinical response of topical tazoretene to topical corticosteroids in psoriasis vulgaris showed the following trends in PASI reduction

Medicine used	Base PASI	PASI at 4weeks (reduction %)	PASI at 12weeks (reduction %)
Tazoretene	8.8	8.2 (5.9%)	4.6 (47.3%)
Mometasone	10.4	8.9 (13.4%)	7 (68%)

DISCUSSION

A recent survey by Klaassen et al. found nail involvement in 66.0 % of 1459 psoriasis patients, which indicates that the prevalence of nail psoriasis might often be underestimated [v]. Among patients with

psoriatic arthritis (PsA), the prevalence of nail psoriasis may be >80 % [vi]. Nail psoriasis in the absence of cutaneous or joint disease is present in 5–10 % of psoriatic patients [vii]. Psoriatic nail disease may be considered an indicator for patients at risk for future psoriatic joint damage [viii]. In a comparative study on the efficacy of various topical treatments for psoriasis done by Samuel Jeyaraj Daniel et al, he has concluded that effectiveness of topical lipsomal dithranol is equivalent to the of betamenthasone valerate in plaque type of psoriasis. Similarly, Santosh kumar et al conducted a study comparing the clinical response of topical tazoretene to topical corticosteroids in chronic plaque psoriasis. He found the significant reduction or difference of mean PASI score as compared to baseline in both groups to be statistically signignificant ($p<0.001$). According to this study, both tazarotene gel and mometasone cream was found to be effective in the reduction of PASI score and clearence of the lesions significantly [ix].

Calcipotiol is a synthetic derivative of Vitamin D which has a well documented effect in the treatment of psoriasis. Numerous studies have been done to evaluate the effectiveness of calcipotriol ointment alone, or in combination with cordicosteroids, or in combination with both corticosteroids and NB UVB phototherapy. According to Ramsay et al, Calcipotriol compares well with other standard forms of topical therapy for psoriasis. Irritation of the skin may occur but is generally mild. Treatment can often be restarted after the irritation has cleared. Therefore, treatment with calcipotriol ointment, cream or solution is effective and safe [x]. Another study, done by Lebwhol et al, concludes that Psoriasis regimens combining calcipotriene ointment with superpotent steroids such as halobetasol ointment can result in greater improvement and fewer side effects [xi]. since In long-term regimens for psoriasis, substituting calcipotriene for topical corticosteroids may result in a steroid-sparing effect. Published data are reviewed on the pharmacology, efficacy, tolerability, and pleasantness of the vitamin D(3) analogue calcipotriol in a cream formulation (Daivonex/Dovonex cream; LEO Pharma AS, Denmark) in the treatment of psoriasis. Calcipotriol cream monotherapy is more effective than placebo, and as effective as betamethasone valerate cream and coal tar in psoriasis. A regimen of morning-cream and evening-ointment is equally effective as twice-daily calcipotriol ointment and is preferred by patients. Calcipotriol cream is also a highly efficacious maintenance treatment used alone or in an alternating regimen with calcipotriol/betamethasone dipropionate ointment. Short- and long-term trials have demonstrated that calcipotriol cream is well tolerated by patients with psoriasis. Irritation is observed less frequently than with calcipotriol ointment, making the cream very suitable for children and thin or sensitive areas, such as flexures or (off-label use) the face. Calcipotriol cream is generally preferred to the ointment formulation, as shown by preference testing, and leads to improved patient compliance. In conclusion, calcipotriol cream is not only an effective treatment for psoriasis but is pleasant to use and well tolerated even in sensitive areas. Therefore, calcipotriol cream is particularly useful for the maintenance treatment of psoriasis, after induction therapy with a fast-acting vitamin D/steroid two-compound product [xii]. In a study done by Woo WK et al, on the combination therapy of TL01 UVB phototherapy and topical calcipotriol for psoriasis, there were no significant differences in demographic characteristics and baseline PASI and PDI scores between the two groups. The mean PASI score declined

significantly (P < 0.01) for both groups after treatment. The difference in mean PASI score reduction from baseline between the two groups was only significant during the first eight sessions, with a net reduction of 3.6 (95% confidence interval 1.0-6.2, P = 0.008) in the active group relative to the control group. The mean PDI score declined significantly (P < 0.05) for both groups, but there was no statistical difference in mean PDI score reduction between the two groups (P = 0.8) at the end of treatment. The mean cumulative UVB dose for the active group was significantly lower (P < 0.02) at 16 204 mJ cm-2 compared with 21 082 mJ cm-2 for the control group. Hence they concluded that combining TL01 phototherapy with topical calcipotriol cream has a UVB-sparing effect [xiii]. In another study on the combination therapy of NB UVB with topical calcipotriol, done by Rim JH et al 90.0% patients (n = 9) in the calcipotriol-narrow-band UVB group and 61.1% patients (n = 11) in the narrow-band UVB group showed grade IV at the end of therapy. The calcipotriol-narrow-band UVB group showed more rapid improvement at the early stage. The final and total UVB dose were slightly lower in the calcipotriol-narrow-band UVB group but no significant difference was observed with respect to the total number of irradiations, duration of treatment, final UVB dose or total cumulative UVB dose required to reach grade IV in both groups (P > 0.05). The pattern of adverse effects was similar in both groups with a slightly higher frequency in the calcipotriol-narrow-band UVB group. So this study concluded that the total cumulative UVB dose required to reach grade IV was not significantly different in both groups, although it was slightly lower in the calcipotriol-narrow-band UVB group. However, a higher percentage of patients attained grade IV at the end of therapy in the combination group and this therapy was more effective in reducing the Psoriasis Area and Severity Index (PASI)early in treatment More studies are warranted to confirm these results [xiv]. Another study conducted by Molin et al showed that the therapeutic effect of the combination of calcipotriol and UVB was enhanced as compared to calcipotriol alone and UVB alone. Also, there was a significant reduction of the psoriasis area and severity index (PASI) with the combination after 2 weeks as compared to calcipotriol alone. At the end of treatment significantly more sides were cleared after calcipotriol + UVB than after calcipotriol alone. There was a significantly faster onset of improvement on the sides treated with calcipotriol + UVB than on those treated with vehicle + UVB. After 2 weeks there was a significant difference in PASI in favour of calcipotriol + UVB. At the end of treatment, however, there was no difference between the treatments. There was a similar adverse event profile with either treatment. The addition of UVB to calcipotriol did not alter the tolerability or safety of topically applied calcipotriol. So this study concluded that there is beneficial effect of combining calcipotriol and phototherapy [xv].

CONCLUSION

On the basis of the literatures reviewed, I conclude that psoriasis is a chronic, disfiguring and debilitating disease. It can be managed and controlled using various treatment modalities that are available, including topical use of coal tar, Anthralin, topical Glucocorticoids, salicyclic acid, Vit-D analogues like calcipotriol, tazarotene and topical cytostatic therapies like 5% flurouracil;

Systemic drugs like corticosteroids, Methotrexate, Cyclosporin etc; Phototherapy; or a combination of any two or three. A combination therapy with topical agents and NB UVB is very effective in the

management of Plaque type psoriasis, which incidentally is the commonest type encountered in clinical practice. Compared to the use of topical therapy alone, its combination with phototherapy has a better reduction of PASI score and is thus a better option.

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