e-ISSN: 0976-822X, p-ISSN:2961-6042

Available online on http://www.ijcpr.com/

International Journal of Current Pharmaceutical Review and Research 2024; 16(3); 448-451

Original Research Article

A Retrospective Study Evaluating the Effectiveness of Several Topical Treatments for Persistent Plaque Psoriasis

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Received: 10-01-2024 / Revised: 14-02-2024 / Accepted: 22-03-2024
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Conflict of interest: Nil

Abstract

Aim: To determine the effectiveness of several topical treatments for persistent plaque psoriasis.

Material and Methods: It was a retrospective study was conducted Department of Dermatology, GMCH, Purnia, Bihar, India for one year. The present study was carried out on patients having chronic plaque type psoriasis vulgaris. After obtaining ethical clearance, written, informed and signed consent patients suffering from stable chronic plaque type psoriasis involving less than 10% of body surface area and those had neither applied topical for last 2 weeks and nor taken systemic drugs for psoriasis for last three months, were enrolled. Total 75 patients were enrolled and were divided in three groups comprising of 20 patients in each group. Group A patients were asked to apply ammonium lactate twice a day, Group B patients were asked to apply ammonium lactate in morning and clobetasol propionate in evening, Group C patients were asked to apply topical ammonium lactate in morning and calcipotriol in evening.

Result: No significant difference was noted between study groups (p=0.630). Further on comparison of individual groups it was found that significant difference was present between PASI at 8 weeks between group A and group B (p=0.045), group A and group C (p=0.030) but between group B and group C (p=0.990) difference was not significant. PASI 50 was calculated in all three groups and it was found that 9(45%) out of 20 subjects attained PASI 50 in group A, 13(65%) out of 20 patients in group B and 13(65%) out of 20 patients in group C. Physician global assessment scale shows that in Group A, 5(25%) patients had excellent response, 4(20%) patients had good response, and 4(20%) patients had fair response whereas 7(35%) patients had poor response. In group B, 6(30%) patients had excellent response, 7(35%) patients had good response, and 3(15%) patients had fair response whereas 4(20%) patients had poor response. In group C, 6(30%) patients had excellent response, 7(35%) patients had good response, and 2(10%) patients had fair response whereas 5(25%) patients had poor response.

Conclusion: Combination therapy is effective, well tolerated with minimal side effects and better compliance was seen with patients. Ammonium lactate 12% can also be considered as one of the topical options as a monotherapy and also as a maintenance therapy. But more number of Indian studies are required as there is paucity of literature on topical treatment of psoriasis.

Keywords: Topical, Treatments, plaque psoriasis

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Introduction

Chronic plaque psoriasis is the most common form of psoriasis, characterized by well-defined erythematous plaques with silvery scales that typically affect the scalp, elbows, knees, and lower back. It is a chronic immune-mediated inflammatory condition involving dysregulation of cytokines, particularly tumour necrosis factor-alpha (TNF-α), interleukin-12 (IL-12), and IL-23, leading to keratinocyte hyperproliferation and inflammation. [1-3] Topical treatments form the cornerstone of therapy for localized psoriasis, offering targeted delivery of medications directly to affected skin areas. Various topical agents, including corticosteroids, vitamin D analogues, calcineurin inhibitors, and tar preparations, are widely used based on their mechanisms of action and efficacy profiles. Corticosteroids are potent anti-inflammatory agents that suppress immune responses and reduce epidermal hyperproliferation. They are classified based on potency, ranging from mild (e.g., hydrocortisone) to potent (e.g., clobetasol propionate). [4,5] Corticosteroids are effective in reducing inflammation and scaling in psoriatic plaques, making them first-line treatments for mild to moderate disease. However, long-term use may lead to skin thinning and other local adverse effects. Vitamin D analogues such as calcipotriol (calcipotriene) exert their effects by modulating

keratinocyte differentiation and proliferation, as well as immune responses. They are effective in reducing psoriatic plaques' thickness and scaling without the risk of skin atrophy associated with corticosteroids. Combining vitamin D analogues with corticosteroids enhances efficacy and reduces adverse effects, offering a synergistic approach to treatment. [6-9] Topical calcineurin inhibitors, including tacrolimus and pimecrolimus, inhibit T-cell activation and cytokine production, thereby reducing inflammation in psoriatic lesions. They are particularly useful in sensitive areas such as the face, intertriginous areas, and genitalia where corticosteroid use may be limited. Calcineurin inhibitors are steroid-sparing agents that provide a safe alternative for long-term maintenance therapy in chronic plaque psoriasis. Coal tar preparations have been used for decades in the treatment of psoriasis due to their anti-inflammatory and antiproliferative effects on keratinocytes. They reduce scales, itching, and inflammation, although their characteristic odor and potential for skin irritation limit their widespread use. [10-13] Despite these drawbacks, tar preparations remain valuable options, especially in patients who prefer nonsteroidal therapies or in combination with other topical agents.

Material and Methods

It was a retrospective study was conducted Department of Dermatology, GMCH, Purnia, Bihar, India for one year. The present study was carried out on patients having chronic plaque type psoriasis vulgaris. After obtaining ethical clearance, written, informed and signed consent patients suffering from stable chronic plaque type psoriasis involving less than 10% of body surface area and those had neither applied topical for last 2 weeks and nor taken systemic drugs for psoriasis for last three months, were enrolled. Total 75 patients were enrolled and were divided in three groups comprising of 20 patients in each group. Group A patients were asked to apply ammonium lactate twice a day, Group B patients were asked to apply ammonium lactate in morning and clobetasol propionate in evening, Group C patients were asked to apply topical ammonium lactate in morning and calcipotriol in evening. Each patient was asked to do follow up at four weeks and eight weeks interval and response of treatment was evaluated subjectively and objectively. PASI scoring of each patient was done at baseline, at the end of 4 weeks and at the end of 8 weeks. So that after 8 weeks psoriasis, severity and clinical response will be assessed based on PASI scores and subjective assessment by Physician Global Assessment Scale. PASI (Psoriasis Area Severity Index) Score for the selected patients was taken at baseline, at the end of 4 weeks and at the end of 8 weeks during the study period. The efficacy of the treatment regimen was analyzed by how many patients attained PASI 50(i.e. 50% reduction in disease) at the end of the study i.e. 8 weeks. In literature attainment of PASI 50 is considered a satisfactory and a meaningful response.[12]

Assessment of the effect of treatment Physicians Global Assessment Scale (PGAS)

Poor	0–24% clearing
Fair	25–49% clearing
Good	50–74% clearing
Excellent	75–99% clearing
Clear	100% clearing

Result

In Table 1 Comparison of mean PASI at 8 weeks between study groups was performed using ANOVA. No significant difference was noted between study groups (p=0.630). Further on comparison of individual groups it was found that significant difference was present between PASI at 8 weeks between group A and group B (p=0.045), group A and group C (p=0.030) but between group B and group C (p=0.990) difference was not significant.

Table 1: Multiple Comparisons of mean PASI at 8 weeks between groups (Post hoc analysis Tukey's HSD)

Dependent Variable	(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	P value	95% Confidence Interval	
						Lower Bound	Upper Bound
PASI at 8 weeks	Group A	Group B	1.00500	1.12068	.045	-1.6918	3.7018
	Group A	Group C	.85000	1.12068	.030	-1.8468	3.5468
	Group B	Group C	-.15500	1.12068	.990	-2.8518	2.5418

In Table 2 PASI 50 was calculated in all three groups and it was found that 9(45%) out of 20 subjects attained PASI 50 in group A, 13(65%) out of 20 patients in group B and 13(65%) out of 20 patients in group C.

Table 2: Assessment of PASI 50 in Groups (A, B, C)

Characteristics		Group		
		Group A	Group B	Group C
PASI 50	No	11(55%)	7(35%)	7(35%)
	Yes	9(45%)	13(65%)	13(65%)
Total		20	20	20

In Table 3 Physician global assessment scale shows that in Group A, 5(25%) patients had excellent response, 4(20%) patients had good response, and 4(20%) patients had fair response whereas 7(35%) patients had poor response. In group B, 6(30%) patients had excellent response, 7(35%) patients had good response, and 3(15%) patients had fair response whereas 4(20%) patients had poor response. In group C, 6(30%) patients had excellent response, 7(35%) patients had good response, and 2(10%) patients had fair response whereas 5(25%) patients had poor response.

Table 3: Comparison of Physician Global assessment scale between Groups (A, B, C)

PGAS		Group		
		Group A	Group B	Group C
Poor	0-24%	7(35%)	4(20%)	5(25%)
Fair	25-49%	4(20%)	3(15%)	2(10%)
Good	50-74%	4(20%)	7(35%)	7(35%)
Excellent	75-99%	5(25%)	6(30%)	6(30%)
Total		20	20	20

Discussion

Psoriasis is a common, chronic, inflammatory disease of the skin. The present study was done on patients having psoriasis vulgaris less than 10% body surface area and they were treated with various topical agents. In present study, all baseline parameters were compared and were found to be compatible with each other. In all three groups mean PASI was calculated at 4 and 8 weeks. When efficacy was compared individually between groups at 4 weeks and 8 weeks, significant difference was found between group A and group B (p value =0.020 and 0.045 at 4 and 8 weeks respectively) and between group A and group C (p value= 0.019 and at 0.030 at 4 and 8 weeks respectively) but no significant difference was found between group B and group C (p value= 0.585 and 0.990 at 4 and 8 weeks respectively) showing that group B and group C are equally effective but group A is less effective than group B and group C. PASI 50 was attained by 45% patients in group A, 65% patients each in group B and in group C. Physician Global Assessment Scale was used, 45% patients in group A, 65% patients in group B and 65% patients in group C had ≥50% clearing of lesions. In each group one patient had erythema and one had skin irritation (burning sensation). During the course of the study, 7 patients dropped out in group A, 3 patients in group B and 5 patients in group C. On telephonic conversation they informed inability to come on scheduled date because of personal reasons such as duties, financial issues for travelling and not getting satisfactory response after topical

Regular and appropriate use of emollients improves comfort and reduces scaling, fissuring, and itching in patients with plaque or scalp psoriasis. [14,15] Guidelines of care for the management of psoriasis and psoriatic arthritis state that when used as a control in topical steroid trials, non-medicated topical moisturizers demonstrated a response rate ranging from 15 to 47%. [13,16] This broad range shows great variability of their composition. In 2 small clinical trials which includes 111 patients shows that emollients used as a monotherapy may improve skin hydration, barrier function, as well as proliferation and differentiation markers in patients with psoriasis [17,18] the clinical response showed only a slight symptomatic improvement of psoriasis. In a randomized study done by Emer et al it was found that combination therapy of twice-daily ammonium lactate lotion and halobetasol ointment for two weeks effectively cleared plaque psoriasis in approximately 75% of patients whereas Halobetasol ointment weekend-only maintenance therapy in combination with twice-daily ammonium lactate lotion effectively sustained initial improvement for a significantly longer period of time when compared with placebo. [19] Adding a second agent (keratolytic, emollient, vitamin D analogue) may also help effectively maintain clearance and offer a corticosteroid sparing option. A meta- analysis of 22 studies reported that clearing rates following monotherapy ranged from 2 to 85 percent versus

clearance rates of 39 to 100 percent for combination the rapies.

Conclusion

Combination therapy is effective, well tolerated with minimal side effects and better compliance was seen with patients. Ammonium lactate 12% can also be considered as one of the topical option as a monotherapy and also as a maintenance therapy. But more number of Indian studies are required as there is paucity of literature on topical treatment of psoriasis.

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