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Original Research Article

# Evaluation of the Effectiveness of Various Topical Agents for Chronic Plaque Type Psoriasis

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**Abstract:**

**Background:** An inflammatory, hyperproliferative, prevalent chronic illness of the skin and joints, psoriasis is characterized by erythematous plaques coated in silvery white scales. There are numerous systemic and topical therapy options available. Our study's objectives were to examine the effects of ammonium lactate 12% lotion as a monotherapy and in combination with clobetasol propionate (0.05%) and calcipotriol (0.005%) in patients with chronic plaque type psoriasis, as well as the side effects of these medications. Our goal was to ascertain the effectiveness of various topical agents in treating chronic plaque type psoriasis.

**Methods:** From July 2023 to December 2023, patients with chronic plaque type psoriasis vulgaris who were enrolled in the dermatology outpatient department of the Department of Dermatology at ESCI MCH, Bihta, Patna, Bihar, were the subjects of the current study. A total of sixty patients were enrolled, and they were split up into three groups, each with twenty patients. Patients in Group B were instructed to apply clobetasol propionate in the evening and ammonium lactate twice daily, while patients in Group C were instructed to apply topical ammonium lactate in the morning and calcipotriol in the evening.

**Results:** According to the physician global assessment scale, of the patients in Group A, 25% patients had excellent response, 20% patients had good response, and 20% patients had fair response whereas 35% patients had poor response. In group B, 30% patients had excellent response, 35% patients had good response, and 15% patients had fair response whereas 20% patients had poor response. In group C, 30% patients had excellent response, 35% patients had good response, and 10% patients had fair response whereas 25% patients had poor response.

**Conclusion:** Combination therapy has been shown to improve patient compliance and is safe, well-tolerated, and has few adverse effects. Ammonium lactate 12% is another topical alternative that can be used as a maintenance therapy or as a monotherapy.

**Keywords:** Psoriasis, Ammonium lactate, Topical, Calcipotriol.



## Introduction

Psoriasis vulgaris, also referred to as chronic plaque psoriasis, is the most prevalent variety of psoriasis. [1] It is characterized by red, scaly patches and chronicity, with exacerbations and remissions [2,3]. Psoriasis can range in severity from moderate, hardly perceptible to severe, occasionally necessitating hospitalization. [2]. In general care, topical antipsoriatic treatment is appropriate for about 80% of psoriasis patients who have mild-to-moderate illness. [4]

Although psoriatic lesions are usually well-defined and range in size and degree of inflammation, they are rarely painful. They might be irritating. [2] Although the illness can occur anywhere on the body, the elbows, knees, and scalp are the most commonly affected areas. Plaques can become unpleasant fissures and splits in certain patients.3 The psychological toll and social disgrace associated with "mild" psoriasis are frequently disregarded, and the resulting reduction in quality of life (QoL) is comparable to that of chronic heart disease. [6]

These days, psoriasis is recognized as a multisystem inflammatory illness that either raises the chance of other comorbidities or is linked to them. [7] It is believed that a person's immune system, genetic predisposition, and particular environmental circumstances interact to cause psoriasis. [8] Genetically susceptible individuals are exposed to a variety of disease "triggers," such as alcohol consumption, cigarette smoke, drug treatments (such as

antimalarials, β-blockers, lithium, and nonsteroidal anti-inflammatory drugs), general illness, HIV infection, improper diet, inactivity, and stress. [2, 9, 10]

## Material and Methods

The present study was conducted from July 2023 to December 2023 on patients with chronic plaque type psoriasis vulgaris who were seen at the dermatology outpatient department (OPD) of the department of dermatology at ESCI Medical College and Hospital, Bihta, Patna, Bihar.

Patients with stable chronic plaque type psoriasis affecting less than 10% of body surface area who had not used topical treatments for the previous two weeks or taken systemic medications for the previous three months were enrolled after providing written, informed, and signed consent. A total of sixty patients were enrolled, and they were split up into three groups, each with twenty patients. Patients in Group A were instructed to apply ammonium lactate twice daily; patients in Group B were instructed to apply ammonium lactate in the morning and clobetasol propionate in the evening; and patients in Group C were instructed to apply topical ammonium lactate in the morning and calcipotriol in the evening. Subjective and objective evaluations of each patient's response to treatment were conducted at four-week and eight-week intervals. At baseline, four weeks, and eight weeks, each patient's PASI score was completed. Psoriasis severity and clinical response will be evaluated after eight weeks using the Physician Global Assessment Scale and PASI scores for subjective evaluation.

During the course of the study, baseline, 4-week, and 8-week PASI (Psoriasis Area Severity Index) scores were obtained for the chosen patients. The number of patients who achieved PASI 50, or a 50% reduction in illness, at the conclusion of the study eight weeks was used to assess the effectiveness of the treatment plan. Achieving PASI 50 is regarded in the literature as a meaningful and satisfying answer. [12]

## Result

Table 1 shows the results of an ANOVA comparison of the mean PASI at 8 weeks among the study groups. Between the study groups, there was no discernible difference (p=0.630). Upon closer examination of the individual groups, it was shown that there was a significant difference in PASI at 8 weeks between groups A and B (p=0.045) and A and C (p=0.030), but not between groups B and C (p=0.990).

**Table 1: Multiple Comparisons of mean PASI at 8 weeks between groups (Posthocanalysis using Tukey's HSD)**

| Dependent Variable | (I) Group | (J) Group | Mean Difference(I-J) | Std. Error | P value | 95%ConfidenceInterval | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound |
| PASIat8 weeks | Group A | Group B | 1.00500 | 1.12068 | 0.045 | -1.6918 | 3.7018 |
| | Group A | Group C | 0.85000 | 1.12068 | 0.030 | -1.8468 | 3.5468 |
| | Group B | Group C | -0.15500 | 1.12068 | 0.990 | -2.8518 | 2.5418 |

Table 2 shows that after calculating PASI 50 for each of the three groups, 9 (45%) of the 20 patients in group A, 13 (65%) of the 20 patients in group B, and 13 (65%) of the 20 patients in group C achieved PASI 50.

**Table 2: Assessment of PASI50 in Groups (A, B, C)**

| Characteristics | | Group | | |
|---|---|---|---|---|
| | | Group A | Group B | Group C |
| PASI50 | No | 11(55%) | 7(35%) | 7(35%) |
| | Yes | 9(45%) | 13(65%) | 13(65%) |
| Total | | 20 | 20 | 20 |

Table 3 of the Physician Global Assessment Scale demonstrates that, of the patients in Group A, 5 (25%) had an excellent response, 4 (20%) had a good response, and 4 (20%) had a fair response. In contrast, 7 (35%) patients in the group had a poor reaction. Six (30%) patients in group B had an excellent reaction, seven (35%) had a good response, three (15%) had a fair response, and four (20%) had a poor response. Six (30%) patients in group C had an excellent response seven (35%) had a good response, two (10%) had a fair response, and five (25%) had a poor response.

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

| Physician Global assessment scale (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

A prevalent, long-term, inflammatory skin condition is psoriasis. Patients with psoriasis vulgaris affecting less than 10% of their body surface area were included in the current study and received a range of topical treatments. All baseline parameters in the current investigation were compared and confirmed to be mutually comparable. The mean PASI was determined at 4 and 8 weeks for each of the three groups. The efficacy of each group was compared separately at 4 and 8 weeks. Group A and group B showed a significant difference (p values of 0.020 and 0.045 at 4 and 8 weeks, respectively), as did group A and group C (p values of 0.019 and 0.030 at 4 and 8 weeks, respectively). Group B and group C, on the other hand, showed no significant difference (p values of 0.585 and 0.990 at 4 and 8 weeks, respectively), indicating that group B and group C are equally effective, while group A is less effective than both group B and group C. 45% of patients in group A and 65% of patients in groups B and C both reached PASI 50.45% of patients in group A, 65% of patients in group B, and 65% of patients in group C had ≥50% lesion clearance when the Physician Global Assessment Scale was employed. One patient in each group experienced burning feeling on their skin, and the other got erythema. Seven patients in group A, three in group B, and five in group C discontinued the study during its duration. They stated over the phone that they would be unable to arrive on the appointed date due to personal reasons, including obligations, lack of funds for travel, and unsatisfactory reaction following topical for patients with plaque or scalp psoriasis, regular and adequate use of emollients lowers scaling, fissuring, and itching while also improving comfort. [12,13]

According to guidelines for managing psoriasis and psoriatic arthritis, non-medicated topical moisturizers showed a response rate ranging from 15 to 47% when used as a control in topical steroid trials. [11,14] This wide range demonstrates how varied their composition is. Emollients administered as a monotherapy may improve skin moisture, barrier function, as well as proliferation and differentiation indicators in psoriasis patients, according to two small clinical trials involving 111 participants. [15,16] The clinical response revealed only a modest reduction in psoriasis symptoms. [15]

A two-week combination therapy of twice-daily ammonium lactate lotion and halobetasol ointment effectively cleared plaque psoriasis in about 75% of patients, according to a randomized study by Emer et al. Additionally, when halobetasol ointment was used as weekend-only maintenance therapy in conjunction with twice-daily ammonium lactate lotion, the initial improvement was maintained for a significantly longer period of time. [17] A second medication (emollient, vitamin D analogous, keratolytic) may also be added to aid preserve clearance and provide a corticosteroid sparing option. Clearance rates after monotherapy varied from 2 to 85%, while clearance rates after combination treatments ranged from 39 to 100%, according to a meta-analysis of 22 studies.

Emollient lotion (12% ammonium lactate) is therefore also beneficial when used alone. According to research, combo medication is more effective than monotherapy.

## Conclusion

Combination therapy has been shown to improve patient compliance and is safe, well-tolerated, and has few adverse effects. Ammonium lactate 12% is another topical alternative that can be used as a maintenance therapy or as a monotherapy. However, considering there is a dearth of literature on topical psoriasis treatment, more research from India is needed.

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