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## A hospital based assessment of the effects of various topical agents in chronic plaque type psoriasis

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### Abstract

**Aim:** To determine the effect of various topical agents in chronic plaque type psoriasis.

**Materials and Methods:** The study was carried out on patients having chronic plaque type psoriasis vulgaris came to the Department of Dermatology, Chandulal Chandrakar Memorial Medical College, Durg, Chhattisgarh, India. Total 300 patients were enrolled and were divided into three groups comprising of 100 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.

**Results:** Physician global assessment scale shows that in Group A, 39% patients had excellent response, 15% patients had good response, and 21% patients had fair response whereas 25% patients had poor response. In group B, 35% patients had excellent response, 29% patients had good response, and 17% patients had fair response whereas 19% patients had poor response. In group C, 31% patients had excellent response, 28% patients had good response, and 22% patients had fair response whereas 19% 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 option as a monotherapy and also as a maintenance therapy.

**Keywords:** Psoriasis, topical therapy, corticosteroids, ammonium lactate, clobetasol, calcipotriol

### Introduction

Psoriasis is a chronic skin illness that manifests as red, flaky, crusty patches of skin covered with silvery scales on the surface of the skin. Psoriasis has a multifactorial etiopathogenesis, which means it is caused by a mix of environmental and genetic causes. Various researches have hypothesised the etiopathogenesis of the disease. Antigen presentation cells (APC's), langerhan cells, macrophages, natural killer (NK) cells, Th1 type cytokines, and numerous growth factors, including vascular endothelial growth factor (VEGF), keratinocyte growth factor (KGF), among others, all play essential roles in the pathophysiology of the disease.<sup>[1]</sup> In India, the prevalence of psoriasis varies from 0.44%–2.8%<sup>[2]</sup>. The majority of these patients have mild-to-moderate disease and can be treated with topical agents which provide potential therapeutic efficacy and limit the adverse effects of the systemic treatment to the target tissue. The approximate estimate of psoriatic patients in India accounts for 2.3%<sup>[3]</sup>.

Topical agents may be used occasionally or continually, depending on the situation. The use of more powerful drugs must be limited to a short period of time in order to allow for response, after which patients should be directed to occasionally take these medications for long-term treatment<sup>[4]</sup>. This method may help to lessen the likelihood of experiencing adverse effects. Patients who need ongoing topical treatment, on the other hand, should be counseled to take the least powerful agent that will still allow for disease management, or they should be switched to a topical drug that is linked with the lowest long-term risk. All patients receiving topical medication should have their skin checked on a frequent basis to ensure that any adverse effects do not manifest themselves<sup>[4,5]</sup>.

To the best of our knowledge, the use of ammonium lactate has been examined in the treatment of allergic skin conditions, but there has been just a little research on its use in psoriasis vulgaris. In this study, the effects of ammonium lactate 12 percent lotion as monotherapy and in combination with clobetasol propionate (0.05 percent) and calcipotriol

(0.005 percent) on patients with chronic plaque type psoriasis were investigated. Additionally, the side effects of ammonium lactate, clobetasol propionate, and calcipotriol were investigated in patients with chronic plaque type psoriasis.

**Methodology**

The study was carried out on patients having chronic plaque type psoriasis vulgaris came to the Department of Dermatology, Chandulal Chandrakar Memorial Medical College, Durg, Chhattisgarh, India. Total 300 patients were enrolled and were divided into three groups comprising of 100 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.

**Inclusion criteria:** 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.

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.

**Results**

No significant difference was noted between study groups. 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, group A and group C but between group B and group C difference was not that much significant.

**Table 1:** PASI assessment of patients clinically at different time intervals

Group	Baseline	Week 4	Week 8
Group A	6.025	5.67	5.32
Group B	6.653	5.411	4.077
Group C	6.92	5.835	4.45

**Table 2:** PASI 50 effectiveness of all regimen

Characteristics	Group			
	Group A	Group B	Group C	
PASI 50	Yes	41	62	64
	No	59	38	36

**Table 3:** PGAS assessment of all the three groups

PGAS		Groups		
		Group A	Group B	Group C
Poor	0-24%	25	19	19
Fair	25-49%	21	17	22
Good	50-74%	15	29	28
Excellent	75-99%	39	35	31
		100	100	100

Physician global assessment scale shows that in Group A, 39% patients had excellent response, 15% patients had good response, and 21% patients had fair response whereas 25% patients had poor response. In group B, 35% patients had excellent response, 29% patients had good response, and 17% patients had fair response whereas 19% patients had poor response. In group C, 31% patients had excellent response, 28% patients had good response, and 22% patients had fair response whereas 19% patients had poor response.

**Discussion**

Psoriasis manifests in varied forms including chronic plaque type, guttate psoriasis, pustular psoriasis and its variants, inverse flexural psoriasis, exfoliative type of psoriasis, regional psoriasis (involving scalp, napkin area, palms and soles).

In our study, 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.

The most common form is chronic plaque psoriasis (psoriasis vulgaris), which accounts for the majority of cases. Psoriasis is characterized by well circumscribed, erythematous plaques with silvery white scales that represent a response to an infiltration of inflammatory T cells producing disease-stimulating cytokines in skin lesions. Although no cure is available, the disease can be effectively controlled by various therapeutic options, used alone or in combination [4]. Topical treatment is best used to treat psoriasis affecting less than 10% of total body surface area [5]. Topical treatments including emollients, topical corticosteroids, vitamin D analogues, tar based preparations, dithranol, salicylic acid and topical retinoids can be used as monotherapy or in combination with other agents.

Ammonium lactate lotion 12% is composed of ammonium lactate (lactic acid), cetyl alcohol, glycerin, magnesium aluminum silicate, water, light mineral oil, propylene glycol, methyl and propylparabens, laureth-4, and polyoxyl 40 stearate [6-8]. When applied to the skin, it has been shown to create a stimulatory response that induces an epidermal proliferation increasing epidermal thickness and hydration and an increased number of granular layers and underlying dermal cells. Lactic acid is an alpha-hydroxy acid and may act as a humectant when applied to the skin. Topical Calcipotriol 0.005% is effective and well tolerated for the treatment of psoriasis. It reduces keratinocytes proliferation and enhances differentiation. These actions are mediated via vitamin D receptors located in the nucleus of keratinocytes. It also inhibits T-cell proliferation and decreases ICAM-1 expression thus exerting an immunomodulatory effect [9]. Clobetasol propionate 0.05% exert anti-inflammatory, anti-proliferative and immunosuppressive action by the induction of phospholipase A2 inhibitory proteins [10].

Clobetasol propionate 0.05% exert anti-inflammatory, anti-proliferative and immunosuppressive action by the induction of phospholipase A2 inhibitory proteins [10]. 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% [11]. 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 the clinical response showed only a slight symptomatic improvement of psoriasis <sup>[12]</sup>.

### Conclusion

New insights in the pathogenesis of psoriasis have enabled identification of new therapeutic targets. Target-based topical agents are being developed and tested. The advent of newer molecules and newer drug delivery systems will significantly expand the therapeutic armamentarium for the treatment of psoriasis. Topical therapies are the backbone of management of psoriasis. They are safe and well tolerated by the patients. 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.

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