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Original Research Article

A Study to Investigate the Effects of Different Topical Treatments on 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 Department of Skin and VD, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar for 1 year. Total 150 patients were enrolled and were divided into three groups comprising of 50 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**: 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 significant. **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.

Keywords: Plaque Type Psoriasis, Ammonium Lactate, Monotherapy.

Introduction

Psoriasis is an immune-mediated disease (a disease with an unclear cause that is characterized by inflammation caused by dysfunction of the immune system) that causes inflammation in the body. There may be visible signs of the inflammation such as raised plaques (plaques may look different for different skin types) and scales on the skin. Symptoms often start between ages 15 and 25 but can start at any age. Men, women, and children of all skin colours can get psoriasis [1].

The estimated global prevalence of Psoriasis is 1% - 11.8% of the general

population depending on the ethnicity [2] and the approximate estimate of psoriatic patients in India accounts for 2.3% [3]. In India, the prevalence of psoriasis varies from 0.44%–2.8% [2]. Etiopathogenesis in Psoriasis is multifactorial, a combination of environmental and genetic factors. Various studies have been postulated in its etiopathogenesis. The T cells, antigen presenting cells (APC's), langerhan cells, macrophages, natural killer (NK) cells, Th1 type cytokines, various growth factors like vascular endothelial growth factor (VEGF), keratinocyte growth factor (KGF), etc play a important role in its pathogenesis [4, 5].

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 [6]. Topical treatment is best used to treat psoriasis affecting less than 10% of total body surface area [4]. Topical treatments including emollients, topical corticosteroids, vitamin D analogues, tar based preparations, dithranol, salicyclic acid and topical retinoids can be used as monotherapy or in combination with other agents.

To the best of our knowledge, ammonium lactate has been studied for atopic dermatitis but only few studies are available for its usage in psoriasis vulgaris. This study is done to study the effect of ammonium lactate 12% lotion as monotherapy and in combination with clobetasol propionate (0.05%) and calcipotriol (0.005%) in patients of chronic plaque type psoriasis and to study the side effects of ammonium lactate, clobetasol propionate and calcipotriol in patients of chronic plaque type psoriasis.

Methodology

The study was carried out on patients having chronic plaque type psoriasis vulgaris came to Department of Dermatology, Anugrah Narayan Magadh Medical College, Gaya, Bihar for 1 year. Total 150 patients were enrolled and were divided into three groups comprising of 50 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 significant.

Table 1: PASI Assement of Patients clinically at baseline, at 4 weeks and after 8 weeks

Group	Baseline	Week 4	Week 8
Group A	5.925	5.19	5.02
Group B	6.181	5.255	4.349
Group C	6.36	5.21	4.71

Table 2: PASI 50 effectivity of all regimens.

Characteristics		Group		
		Group A	**Group B**	**Group C**
PASI 50	**Yes**	20 (40%)	32 (64%)	33 (66%)
	No	30 (60%)	18 (36%)	17 (34%)

Table 3: PGAS assessment of all the three groups

PGAS		Groups		
		Group A	**Group B**	**Group C**
Poor	**0-24%**	12 (24%)	10 (20%)	9 (18%)
Fair	**25-49%**	10 (20%)	8 (16%)	10 (20%)
Good	**50-74%**	8 (16%)	14 (28%)	15 (30%)
Excellent	**75-99%**	20 (40%)	18 (36%)	16 (32%)
		50	50	50

Physician global assessment scale shows that in Group A, 20(40%) patients had excellent response, 8(16%) patients had good response, and 10(20%) patients had fair response whereas 12(24%) patients had poor response. In group B, 18(36%) patients had excellent response, 14(28%) patients had good response, and 8(16%) patients had fair response whereas 10(20%) patients had poor response. In group C, 16(32%) patients had excellent response, 15(30%) patients had good response, and 10(20%) patients had fair response whereas 9(18%) patients had poor response.

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 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.

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 propyl parabens, laureth-4, and polyoxyl 40 stearate [7, 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].

Regular and appropriate use of emollients improves comfort and reduces scaling, fissuring, and itching in patients with plaque or scalp psoriasis [11]. 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% [12]. 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 [13,14] the clinical response showed only a slight symptomatic improvement of psoriasis [14].

Conclusion:

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 options as a monotherapy and also as a maintenance therapy. New insights in the pathogenesis of psoriasis have enabled identification of new therapeutic targets. The advent of newer molecules and newer drug delivery systems will significantly expand the therapeutic armamentarium for the treatment of psoriasis.

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