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Effect of combination of steroids, antibiotic and emollient on atopic dermatitis lesions

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Abstract

Topical steroids are the mainstay of therapy in atopic dermatitis. However, as massive colonization of lesional and non-lesional skin of atopic dermatitis patients with staphylococcus aureus had been proved to exist and aggravate the skin lesions, thus topical antibiotics seem necessary to be added. New combined topical antibiotics and steroid formula eliminate forcefully the organism. Moreover, as topical medication penetrates a moist stratum corneum more effectively than it will penetrate a dehydrated stratum corneum. Thus combining two and not one moderately potent topical steroids, a topical antibiotic with an emollient, in rapidly and effectively controlling atopic dermatitis lesions was the aim of this study. Twenty females with non facial non extensive forms of atopic dermatitis were included in this study. Atopic dermatitis severity scoring was performed using the SCORAD index. Three weeks after the start of therapy (second visit), marked improvement of the treated lesions were observed, especially erythema, oozing/crusting and oedema/papules, with minimization of pruritus and sleep disturbance. These three signs disappeared on the third visit, six weeks after start of therapy, only minimal dryness was detected with no more personal complaints, thus patients were shifted to maintenance therapy with an emollient. The combined topical therapy was effective and safe in rapidly controlling treated lesions.

Key words: *atopic dermatitis; combined therapy; emollient; topical antibiotics; topical steroids*

INTRODUCTION

Atopic dermatitis (AD) remains a therapeutic challenge, and topical corticosteroids continue to have an important role. There are a large number of topical corticosteroids available, classified according to potency (mild, moderate, potent or very potent).[1,2]

In 1974, Leyden et.al. showed that 90% of patients with atopic dermatitis have their skin colonized with staphylococcus aureus (SA).[3] Thereafter, many studies proved the increased carrier state of SA in both involved and uninvolved skin in atopic dermatitis(AD).[4-8] Moreover, as SA produces superantigens that perpetuate the eczema, thus it was presumed that combining moderately potent topical corticosteroid and an antibiotic could tackle AD more effectively than steroids alone.[9,10]

Dry skin is a common skin condition as well as a key aspect of a number of diseases such as atopic dermatitis. Dry skin has an impact on the patient in terms of discomfort, pruritis and impaired quality of life. Within the overall treatment regimen for these diseases, the use of emollients to manage dry skin plays a considerable role in managing skin conditions, to an extent that emollients are considered the mainstay of maintenance therapy for atopic dermatitis.[11-14]

Hence, the primary goal of this study was to evaluate the role of combining two moderately potent topical steroids, a topical antibiotic and an emollient, in effectively and rapidly controlling AD.

Patients and methods

Patients

A total of thirty one patients with atopic eczema were recruited for this study from "Allergy Unit" at Taif University. All the patients satisfied the diagnostic criteria of Hanifin and Rajka for atopic eczema.[15] All patients provided their verbal consent and approval and were voluntarily included in this research study. The study was performed in accordance with the Declaration of Helsinki (South Africa, 1996 amendment) and Good Clinical Practice guideline.

Patients were ineligible for the study if they had only periorbital and /or facial eczema (four cases) or extensively generalized eczema (seven cases) for fear of side effects from the use of two topical steroids on delicate skin or on a large body area. Thus a total of 20 cases were actually included in this study, (age range, 19-26 years; mean age 22.1± 2.07 years; all were females).

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Assessments

Six clinical signs were recorded: erythema, oedema/papulation, oozing/crusting, excoriations, lichenification and dryness. These clinical signs are the most widely used and validated in atopic eczema currently available scoring system: Scoring of Atopic Dermatitis (SCORAD) index, The SCORAD used; scored the extent, six intensity criteria, and subjective symptoms of AD.[16] Disease extent was measured using the rule of nines. The average intensity of each clinical sign was graded on a scale from 0 to 3 (0≥absent, 1≥mild, 2≥moderate, and 3≥severe) at a representative body site, per the SCORAD protocol. Subjective symptoms, pruritus, and sleep loss were evaluated with regard to the last 3 days and nights, and all were scored by the patients. Both subjective items can be graded on a 10-cm visual analogue scale. The SCORAD index formula is: A/5 + 7B/2 + C. In this formula A is defined as the extent (0–100), B is defined as the intensity (0–18) and C is defined as the subjective symptoms (0–20). The maximum SCORAD score is 103.

Mometasone furoate 0.1% and fusidic acid 2% with betamethasone valerate 0.1% were mixed in a glass jar with petroleum jelly (50gm) and were applied on the lesions twice daily. To those with hand and feet eczema, cotton gloves and socks were recommended to be worn respectively following mixture application.

Participant flow and follow up

Participants were first seen at baseline (week 0) when they were assessed for eligibility, provided their verbal consent. All patients who met eligibility criteria started therapy. Participants had clinical assessments at week 3 and week 6. A detailed history was obtained at baseline and SCORAD assessment was also performed at each visit. The primary outcome measure was effective and rapid control of eczematous lesions.

Statistical analysis

Using the t- test, baseline values were compared with visit 2 (week 3) and visit 3 (week 6) values and values of visit 2 (week 3) and visit 3 (week 6) were compared together.

Results

Twenty female patients with atopic dermatitis and an age range of 19-26 years (mean age 22.1±2.07) were included in this study. At baseline, prevalence rate of other allergic problems (Table1) and thorough clinical assessment were done with the determination of the SCORAD score to each case. Thereafter, their eczematous lesions were treated with the combined topical therapy of two steroids, an antibiotics and petroleum jelly.

At baseline, all except one case had had severe form of AD as estimated by the SCORAD index. At the second visit (3 weeks latter) (Table 2), erythema, oozing/crusting and oedema/papules in studied cases showed much more rapid improvement or even disappearance than excoriation, lichenification and dryness, with complete disappearance at the third visit (6 week latter((Table3,4). However, patients were still complaining of minimal pruritus causing slight sleep disturbances.

On visit 3 (week 6), clinical examination revealed minimal dryness with no more personal complaints, thus patients were shifted to maintenance therapy with an emollient.

It was observed that all comparative parameters showed statistically significant difference ($P < 0.000$) at visit 2 and visit 3 ($P < 0.000$) when compared to baseline values and when compared with each other ($P < 0.000$).

During the study period, no local side effects were ever reported by any of the studied cases.

Discussion

Topical corticosteroids have been the mainstay of treatment for AD over the past 40 years.[17] Currently, there is no standard therapeutic regimen for the long-term management of moderate to severe atopic dermatitis but most regimens include a topical steroid and an emollient.[18] Topical applications containing corticosteroid compounds vary greatly in potency. In general the more potent ones are associated with the greater risk of adverse effects.[19]

Mometasone furoate; is a highly effective topical corticosteroid with a less systemic absorption and a low potential for local and systemic side effects.[20,21] Once-daily use of mometasone furoate was found to result in a greater percentage improvement in total atopic dermatitis scores compared with twice-daily betamethasone valerate in one study, and an improvement in pruritus only in another study compared with twice-daily hydrocortisone 17-butyrate.[22,23]

The frequency of application is a key clinical issue when prescribing topical corticosteroids. Topical corticosteroids are available for application one to four times per day. Although there are few empirical data to assess the patterns of prescribing with respect to frequency of application, it is generally accepted that a twice-daily regimen is the most widespread approach to the use of topical corticosteroids in atopic eczema.[20]

Table 1: Demographics and percentage of associated allergies in studied cases

Age in years	Number of patients with history of
Range (mean) 19-26 years (22.1± 2.07 years)	Asthma: 10 (50%)
	Allergic rhinitis: 19 (95%)
	Urticaria: 16 (80%)
	Food allergy: 8 (40%)
	Allergy to animals: 2 (10%)
	Allergy to insects:2 (10%)
	Latex allergy: 2 (10%)

Values indicate number of patients (%)

Table.2: Statistical comparison of SCORAD index score at baseline and after 3 weeks (second visit)

Baseline	Second visit	t	p
48.99±5.01	26.48±4.36	50.163	0.000

Table.3: Statistical comparison of SCORAD index score at baseline and after 6 weeks (third visit)

Baseline	Third visit	t	p
48.99±5.01	10.98±2.41	37.489	0.000

Table.4: Statistical comparison of SCORAD index score at the second and third visits

Second visit	Third visit	t	p
26.48±4.36	10.98±2.41	18.914	0.000

Guidelines from the British Association of Dermatologists suggest that the use of topical corticosteroids should be limited to a few days to a week for acute eczema and for periods of up to 4–6 weeks to gain initial remission for chronic eczema.[24]

Staphylococcus aureus has a peculiar ability to colonize the skin of patients with eczema and AD and is consistently found in eczematous skin lesions in these patients. The skin lesions of 80–100% of patients with eczema and AD are colonized with S. aureus. In contrast, S. aureus can be isolated from the skin of only 5–30% of normal individuals, mainly from intertriginous areas.[8,25,26] A correlation between the severity of the eczema and colonization with S. aureus has been demonstrated, and it has been determined that bacterial colonization is an important mechanism aggravating skin lesions.[26,27,28] Hence the eradication of S. aureus may lead to a steroid-saving effect[25,29,30] Moreover, aside from an anti-inflammatory effect, treatment with topical steroids contributes to a reduction of skin colonization with S. aureus and therefore might affect a further trigger of AD.[31,32] Therefore, a combination topical treatment with antibacterial and corticosteroid agents has been recommended.[33-36]

Topical fusidic acid proved to reduce the prevalence and population density of S. aureus without increasing fusidic acid-resistant S. aureus.[37] Moreover, the new combined fusidic acid-betamethasone lipid formulation showed more strength in eliminating bacteria originally present in these skin lesions, and relieved the dryness of atopic dermatitis skin.[38,39]

Therapies directed towards restoring the impaired barrier function of the epidermis seem to be of significant importance in AD. Emollients, which reconstruct integrity and continuity of stratum corneum, may blockade penetration of air-borne allergens across damaged skin barrier and prevent AD flares.[40] Studies proved that combined steroids with emollients could reduce the total high potency topical corticosteroid consumption, resulted in significantly greater improvement of disease severity, pruritus and skin dryness compared to corticosteroid treatment alone, decreased the risk of irritant contact dermatitis in AD and significantly improved skin dryness and enabled to maintain the achieved remission in the majority of patients.[41-44]

In this study, AD lesions were effectively and rapidly controlled after the six weeks therapy with the topical combination, suggesting that the idea of benefiting from the results of previous studies that showed that the use of combined topical steroids and antibiotics or topical steroids and emollients were much better than topical steroids alone in managing AD. Thus combining all these topical therapy together in a single combination containing two and not one topical steroids; one known of its high efficacy and another that potentiates the action of the used topical antibiotics, with an emollient known for its action in skin barrier repair and thus enhancing the rate of local drug absorption, all this combined together proved their efficacy in controlling non-facial, non extensive AD in a short period of time (six weeks), thus guarding against the hazards of prolonged use of topical steroids, the mainstay of therapy in AD, and emergence of resistant S.aureus strains.

However, no control group was included; as this was not the goal of the study because the efficacy of combined therapy of a single topical steroid with antibiotics or with emollient in AD had been studied extensively and proved its effect, but this new combination idea aimed at finding a rapid and effective control of AD lesions with to assure better compliance of patients and to guard against any side effects.

In spite of the fact that the quality of life indices were not studied, but the great improvement in patients' clinical status are expected to be good solid proof of the improvement of the quality of life of such patients.

Conflict of interest

The author declares that there is no conflict of interest and there that this study was not funded.

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