

# Comparison of efficacy and safety of topical 0.1% tacrolimus ointment versus 0.1% mometasone furoate ointment in mild to moderate chronic hand eczema

Danish Abbas Kazmi, Shehla Shaukat, Mahwish Zahoor, Amina Afzal, Maryam Rafat, Syed Ahmad Ali Gardezi, Muhammad Nadeem\*

Department of Dermatology, King Edward Medical University/ Mayo Hospital, Lahore

\* Department of Dermatology, Fatima Jinnah Medical University, Lahore

**Abstract** *Objectives* To evaluate the therapeutic efficacy and safety of 0.1% tacrolimus ointment versus mometasone furoate 0.1% ointment in mild to moderate chronic hand eczema.

*Methods* It was a randomized control trial carried out in dermatology department unit-II, KEMU/ Mayo Hospital, Lahore. Patients with mild to moderate chronic hand eczema were enrolled with age range between 18-70 years, of either sex. We randomized the patients in two groups A & B by balloting. Group A used tacrolimus 0.1% ointment twice daily for 6 weeks. Group B used mometasone furoate 0.1% ointment twice daily for 6 weeks. The data were collected and analyzed by SPSS version 18 and p-value <0.05 was taken as significant.

*Results* The study was completed by 102 patients, with 51 in each group, with mean age of 32 years and majority were married females. Both the treatment options were found to be equally efficacious with PGA Score showing significant p value at the end of study (p-value = 0.042). The side effects noted were itching and irritation. Irritation was observed in both treatment groups but did not lead to discontinuation of the treatment as it was transient. This complaint was seen more among the Group A patients.

*Conclusion* It is concluded from our study that 0.1% tacrolimus ointment and 0.1% mometasone furoate ointment are equally efficacious and safe in the treatment of mild to moderate chronic hand eczema.

**Key words**

Hand eczema, tacrolimus, mometasone furoate, physician global assessment.

## Introduction

Hand eczema is a common condition, affecting the hands which are mainly in contact with the environment.<sup>1,2</sup> It is associated with erythema, erosions, scaling, crusting, lichenification and itching, which can be very distressing leading to psychological problems for the patients.<sup>3,4</sup> It is a common disease, mainly affecting

females.<sup>2,3</sup> The classification of hand eczema is based on etiology, as well as, on morphology.<sup>2</sup> As the cause is multifactorial so the treatment becomes difficult.<sup>2</sup>

Hand eczema is treated with emollients, topical and systemic steroids, as well as, protection of skin.<sup>3,4,7</sup> A single drug like mometasone for a long-term has shown promise.<sup>4</sup> Eczema has also been responsive to treatment with topical calcineurin inhibitors.<sup>4</sup> Other treatment options include short course of systemic steroids, phototherapy, retinoids, ciclosporine and other immunosuppressive agents.<sup>4,7</sup>

---

### Address for correspondence

Dr. Danish Abbas Kazmi  
Department of Dermatology,  
King Edward Medical University/  
Mayo Hospital, Lahore  
Email: da1216@live.com, Danish.kazmi@nhs.net

Tacrolimus, made from fungus *Streptomyces tsukubanesis*, is a calcineurin inhibitor and has anti-inflammatory effects.<sup>8,9</sup> Hand eczema has been effectively treated with tacrolimus.<sup>8,9</sup> Inflammatory skin diseases like eczema are also effectively treated with topical steroid mometasone furoate.<sup>9</sup>

Katsarou *et al.*<sup>9</sup> conducted a randomized controlled trial on thirty patients with hand eczema and compared mometasone furoate with tacrolimus. They did not find any significant difference between the two groups. Tacrolimus was found to be better tolerated with a similar therapeutic effect.<sup>9</sup> Rani *et al.*<sup>10</sup> in a multicentre trial on 180 patients found mometasone furoate to be significantly effective in treating chronic hand eczema.

In a study conducted by Schnopp *et al.*<sup>11</sup> it was found out that tacrolimus was as effective as mometasone furoate in dyshidrotic plamar eczema. The application of tacrolimus ointment on twice daily basis for 12 weeks in a randomized trial was compared with only vehicle cream in patients who had used glucocorticoids in the past.<sup>12</sup> Tacrolimus showed greater subjective improvement (as assessed by the patient) but no clear benefit with regard to outcomes and recurrence time was noted.<sup>12</sup>

This study was designed to evaluate the therapeutic efficacy and safety of 0.1% tacrolimus versus mometasone furoate 0.1% in mild to moderate chronic hand eczema.

## Methods

After approval from ethical committee, a randomized control trial was carried out in dermatology department unit-II, KEMU/ Mayo Hospital, Lahore. The study was completed by 102 patients, with 51 in each group. Non-probability purposive sampling to include patients was carried out with simple random sampling for grouping of patients. We divided the patients in two groups A and B.

Group A used tacrolimus 0.1% ointment and Group B used mometasone furoate 0.1% ointment.

Patients with mild to moderate chronic hand eczema with ages between 18-70 years, of either sex were enrolled. Patients with known immunodeficiency disease, with comorbidities like psoriasis, atopic dermatitis and patients on systemic therapy (steroids or antihistamines) for the last two months and topical therapy for the last one month were excluded. Pregnant females, patients with secondary infections (bacterial or fungal), with known hypersensitivity to corticosteroids and tacrolimus and presence of skin atrophy of hands were also not taken in the study.

After taking informed written consent, patients were randomly divided by balloting in two equal groups. A detailed clinical history and examination was carried out. Clinical assessment of severity and treatment response was done by physicians global assessment (PGA) score as clear, almost clear, mild, moderate and severe. The extent of disease was estimated as the total percentage involvement of the palms and dorsum of both hands. In group A, patients applied 0.1% tacrolimus ointment twice daily and in group B, patients applied 0.1% mometasone furoate ointment twice daily for 6 weeks or till clearance, respectively. They were followed up fortnightly for further 6 weeks. Clinical photographs were recorded fortnightly to compare with baseline photographs. Efficacy was assessed at the end of the study. The adverse effects experienced by the patient were noted down to evaluate the safety of the drug. All this information was recorded on a pre-designed proforma.

The data were entered in SPSS version 18 for analysis and Friedman's test was applied. For study variables including age, sex, marital status and duration of disease descriptive statistics were used. Frequency, percentage, mean and standard deviation were used for

presenting the demographic variables like age and gender. Both groups were assessed by using Chi-square test for treatment response. Patients were stratified by duration of disease to see its effect. For follow up comparison Friedman test was applied. *P* value  $\leq 0.05$  was taken as statistically significant.

## Results

The study was completed by 102 patients with 51 patients in group A and B each. Mean age of patients in both groups was  $32.9 \pm 10.4$  with minimum being 18 years and maximum 70 years. According to the groups mean age in group A and in group B was  $31.2 \pm 8.2$  and  $33.5 \pm 12.6$  years, respectively. Minimum age of patients in group A and in group B was 23 and 18 years while maximum age was 54 and 70 years, respectively. In group A, there were 29 male and 22 female patients, while in group B there were 13 male and 38 female patients. (Table 1)

In group A, 82.4% and in group B 78.4% patients were married, while in group A, there were 17.7% unmarried and in group B, 21.6% patients were unmarried. In both groups, mean duration of disease was  $26.5 \pm 23$  months with minimum 12 months and maximum 148 months. In group A mean duration of disease

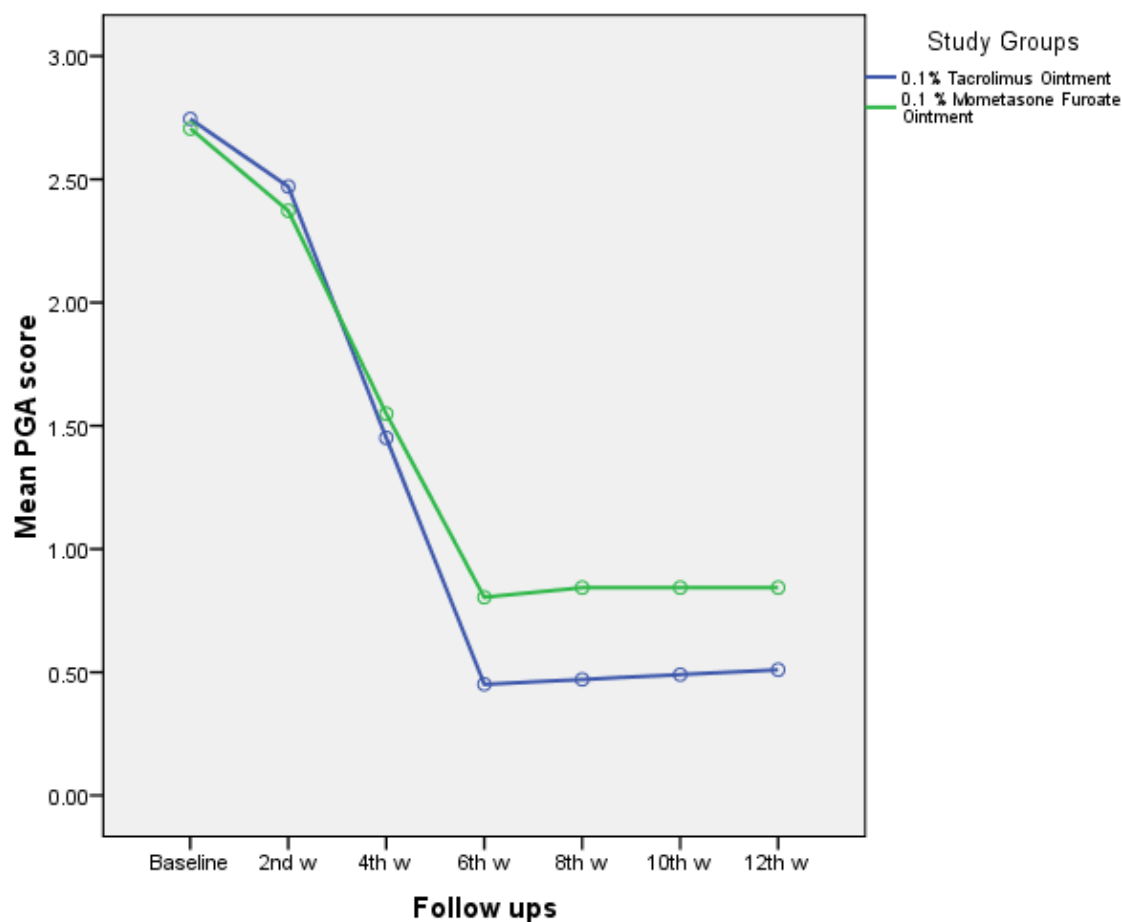
was 28 months and in group B mean duration of disease was 23 months, respectively (Figure 1). At baseline, 13 (25.5%) patients in group A and 15 (29.4%) in group B had mild, 38 (74.5%) patients in group A and 36 (70.6%) in group B had moderate PGA score (Table 1).

At 2<sup>nd</sup> week, 35.3% had mild and 64.7% had moderate disease in group A and in group B 37.3% had mild and 60.8% had moderate disease. At baseline, 2<sup>nd</sup> and 4<sup>th</sup> week no statistically significant difference was seen in PGA score in both groups. However, at 6<sup>th</sup> week significant difference (*p* value=0.012) was seen in PGA score in both groups and at the last follow-up time period i.e. 12<sup>th</sup> week mean PGA score was significantly different within treatment groups but insignificant when compared between groups, Table 1 and Figure 1.

Different side effects were seen in both treatment groups during follow-up time duration. None of the patients in both treatment groups had erythema, photosensitivity or any other type of side effects as a result of treatment in both groups. However, itching and irritation was observed in both treatment groups. In group A, during

**Table 1** Comparison of PGA score in two study groups at base line and follow-up.

Physicians global assessment score	Group A 0.1% tacrolimus ointment (N=51)	Group B 0.1% mometasone furoate ointment (N=51)	<i>P</i> value
<i>Baseline</i>			0.657
Mild	13 (25.5%)	15 (29.4%)	
Moderate	38 (74.5%)	36 (70.6%)	
<i>At 6 weeks</i>			0.012
Clear	33 (64.7%)	18 (35.3%)	
Almost clear	12 (23.5%)	23 (45.1%)	
Mild	6 (11.8%)	10 (19.6%)	
Moderate	0 (0%)	0 (0%)	
<i>12th week</i>			0.104
Clear	33 (64.7%)	21 (41.2%)	
Almost clear	12 (23.5%)	19 (37.3%)	
Mild	4 (7.8%)	9 (17.6%)	
Moderate	2 (3.9%)	2 (3.9%)	



**Figure 1** Comparison of mean PGA score both study groups over different follow-ups.  $P$  value  $< 0.001$  (within groups),  $p$  value  $< 0.418$  (insignificant difference between groups), Friedman test was applied for comparison.

2<sup>nd</sup> week till 12<sup>th</sup> week post-treatment itching was seen i.e. 2<sup>nd</sup> week=11, 4<sup>th</sup> week=11, 6<sup>th</sup> week=3, 8<sup>th</sup> week=0, 10<sup>th</sup> week=0 and 12<sup>th</sup> week=0. However, in group B, itching was seen in patients during course of follow-up. i.e. 2<sup>nd</sup> week=6, 4<sup>th</sup> week=5, 6<sup>th</sup> week=1, 8<sup>th</sup> week=0, 10<sup>th</sup> week=0 and 12<sup>th</sup> week=0. Despite this much difference in both groups for itching no significant association between itching and treatment groups was seen. On the other hand, irritation was observed in patients in both treatment groups during 2<sup>nd</sup> week till 8<sup>th</sup> week. Afterwards none of the patients complained of irritation in both treatment groups. During 2<sup>nd</sup> week till 8<sup>th</sup> week a statistically significant association was seen for irritation in relation to treatment groups. In group A more patients complained about irritation as compared to group B.

## Discussion

The treatment of hand eczema is frustrating as there are very few safe and effective options. A need for an effective and safe modality is continuously being searched for. Topical corticosteroids though mainstay of therapy for hand eczema have multiple side effects with their long-term use. A search for better alternative is still going on. Our study is part of that effort in which we tried to find an effective and safe option for this very common problem in our country.

Our study was conducted to compare the effect of topical tacrolimus ointment and mometasone furoate ointment in mild to moderate chronic hand eczema. Additionally, distribution of disease in various demographic features like age, gender, severity and duration were also identified. Globally used Physicians

global assessment (PGA) score was employed to assess the effect. This score was used because it is relatively comprehensive and self-explanatory, and it has been widely employed in other national and international studies, as well.<sup>5,6</sup> Different other studies assessing effects of treatment in hand eczema patients have used proformas other than PGA. The reason we used this instrument was because of its ease of use and being less time consuming.

The mean age of patients was 31 years in group A and 33 years in group B in our study, which correlates with the study by Katsarou *et al.*<sup>9</sup> in which mean age was 34 and 39 years respectively in each group whereas a different mean age was observed in a study by Schnopp *et al.*<sup>11</sup> in which the mean age was 43 years and age range was between 23-54 years.

According to the gender in group A there were 29 males and 22 female patients. While in group B there were 13 male and 38 female patients. The number of female patients enrolled in our study was higher which correlates with the studies conducted by Katsarou *et al.*<sup>9</sup>, Schnopp *et al.*<sup>11</sup> and Shri *et al.*<sup>13</sup> It indicates that females suffer from chronic hand eczema in a greater proportion as compared to males. It could be due to the fact as observed in our study that females are more involved in household work which exposes them to various allergens which might be the reason for their coming to the hospital in greater number even for mild to moderate hand eczema.

For assessing the severity of hand eczema in patients, PGA score was used. This score has already been performed in various studies and reliable results are achieved through it.<sup>5,6</sup> Thus using this scale, it was seen that majority of patients suffered from moderate hand eczema in our study. Number of female patients again was higher who had moderate disease than males ( $p$  value=0.012). In other studies, also, gender differences were found to be significant

for eczema severity.<sup>5,6</sup> Our findings could be explained by the fact that in our society the use of irritants in the form of detergents, root vegetables, hand creams and misuse of steroids by the females to cover up or to treat hand eczema can worsen the disease.

In group A and in group B mean duration of disease was  $28.27 \pm 6.47$  and  $24.01 \pm 5.83$  months, respectively. The mean duration was 38.6 months (range 12-184 months) in the study by Schnopp *et al.*<sup>11</sup>

We also studied the effect of age and duration of the disease on the severity of hand eczema. Older age group had worse disease with significant  $p$  value. Duration was shown to have no significant effect.

The effect of treatment was studied in our study by comparing the PGA score at baseline and at the end of study. The treatment was found to be equally efficacious in both groups and the results were statistically significant within each treatment group but insignificant when compared with each other, as the results of both treatment options were comparable with each other. Similar results have been observed in clinical trials conducted by Katsarou *et al.*<sup>9</sup> and Schnopp *et al.*<sup>11</sup> who reported no difference between the efficacy of tacrolimus when compared with topical steroids. Schliemann *et al.*<sup>14</sup> also found tacrolimus to be efficacious and tolerable in the treatment of occupational hand dermatitis. Krejci-Manwaring *et al.*<sup>12</sup> and Alomar *et al.*<sup>15</sup> also reported the same in their study on use of tacrolimus in hand eczema. Rani *et al.*<sup>10</sup> found mometasone furoate ointment treatment to be safe and effective in chronic hand eczema which concurs with our study.

Different side effects were seen in both treatment groups during follow up time duration. The side effects mainly reported were transient pruritus and irritability after application of topical tacrolimus and mometasone furoate in some patients but the

symptoms were statistically insignificant in both groups. None of the patients in both treatment groups had erythema, photosensitivity, atrophy or any other type of side effects as a result of treatment. Similar results were observed in the studies conducted by Katsarou *et al.*<sup>9</sup> and Schnopp *et al.*<sup>11</sup> Both treatments were safe and effective in treatment groups.

## Conclusion

It is concluded from our study that 0.1% mometasone furoate ointment and 0.1% Tacrolimus ointment are equally efficacious and safe in the treatment of mild to moderate chronic hand eczema.

Further studies with longer follow up to assess relapse of disease should be conducted. Studies should also be done to see the role of Tacrolimus in severe type of chronic hand eczema.

## References

1. Castanedo-Tardan MP, Zug KA. Allergic contact dermatitis. In: Goldsmith LA, Katz SI, Gilchrist BA, Paller AS, Leffell DJ, Wolff K, eds. *Fitzpatrick's Dermatology in General Medicine, 8th edn.* New York; McGraw-Hill, 2012: p.152-64.
2. Berth-Jones J, Eczema, Lichenification, Prurigo and Erythroderma. In: Burns T, Breathnach S, Cox N, Griffiths C, eds. *Rook's Textbook of Dermatology, 8th edn.* UK: Wiley-Blackwell Publications; 2010: p. 23.1-24.34.
3. Wilkinson SM, Beck MH. Contact dermatitis: Irritant. In: Burns T, Breathnach S, Cox N, Griffiths C, eds. *Rook's Textbook of Dermatology, 8th edn.* UK: Wiley-Blackwell Publications; 2010: p. 25.1-25.26.
4. Robertson L. New and existing therapeutic options for hand eczema. *Skin Ther Lett.* 2009;**14**:1-5.
5. Bissonnette R, Worm M, Gerlach B, Guenther L, Cambazard F, Ruzicka T *et al.* Successful retreatment with alitretinoin in patients with relapsed chronic hand eczema. *Br J Dermatol.* 2010;**162**:420-6.
6. Diepgen TL, Pfarr E, Zimmermann T. Efficacy and tolerability of alitretinoin for chronic hand eczema under daily practice conditions: results of the TOCCATA open study comprising 680 patients. *Acta Derm Venereol.* 2012;**92**:251-5.
7. Coenraads PJ. Hand eczema. *N Engl J Med.* 2012;**367**:1829-37.
8. Chaudhari ND, Talaniker HV, Gupta S, Gupta A, Deshmukh P, Rizvi A. Topical tacrolimus: A boon to dermatology. *Int J Pharm Biomed Sci.* 2012;**3**:188-92.
9. Katsarou A, Makris M, Papagiannaki K, Lagogianni E, Tagka A, Kalogeromitros D. Tacrolimus 0.1% vs Mometasone Furoate topical treatment in allergic contact hand eczema: a prospective randomized clinical study. *Eur J Dermatol.* 2012;**22**:192-6.
10. Rani Z, Kazmi AH, Raza A, Rashid A, Waseem J, Sheikh RA. Efficacy, safety and tolerability of mometasone furoate 0.1% ointment in chronic hand eczema. *J Pak Assoc Dermatol.* 2007;**17**:21-7.
11. Schnopp C, Remling R, Mohrenschlager M, Weigl L, Ring J, Abeck D. Topical tacrolimus (FK506) and mometasone furoate in treatment of dyshidrotic palmar eczema: A randomized, observer-blinded trial. *J Am Acad Dermatol.* 2002;**46**:73-7.
12. Krejci-Manwaring J, McCarty MA, Camacho F, Manuel J, Hartle J, Fleischer A *et al.* Topical tacrolimus 0.1% improves symptoms of hand dermatitis in patients treated with a prednisone taper. *J Drugs Dermatol.* 2008;**7**:643-6.
13. Shri J, Amichal B. Tacrolimus ointment in the treatment of atopic hand eczema. *Indian J Dermatol.* 2006;**51**:66-7.
14. Schliemann S, Kelterer D, Bauer A, John SM, Skudlik C, Schindera I *et al.* Tacrolimus ointment in the treatment of occupationally induced chronic hand dermatitis. *Contact Dermatitis.* 2008;**58**:299-306.
15. Alomar A, Puig L, Gallardo CM, Valenzuela N. Topical tacrolimus 0.1% ointment (Protopic®) reverses nickel contact dermatitis elicited by allergen challenge to a similar degree to mometasone furoate 0.1% with greater suppression of late erythema. *Contact Dermatitis.* 2003;**49**:185-8.