International Journal of Dermatology, Venereology and Leprosy Sciences

E-ISSN: 2664-942X
P-ISSN: 2664-9411
www.dermatologypaper.com
Derma 2019; 2(2): 76-79
Received: 05-07-2019
Accepted: 22-07-2019

Dr. K Lakshmi Suseela
Assistant Professor,
Department of Dermatology,
Narayana Medical College,
Chintareddypalem, Nellore,
Andhra Pradesh, India

Dr. Sriranga Srinivas
Associate Professor,
Department of Dermatology,
Narayana Medical College,
Chintareddypalem, Nellore,
Andhra Pradesh, India

Corresponding Author:
Dr. Sriranga Srinivas
Associate Professor,
Department of Dermatology,
Narayana Medical College,
Chintareddypalem, Nellore,
Andhra Pradesh, India

A study comparing the effectiveness of tacrolimus (0.1%) ointment and clobetasol propionate (0.05%) cream in the treatment of localized vitiligo

K Lakshmi Suseela and Sriranga Srinivas

DOI: https://doi.org/10.33545/26649411.2019.v2.i2b.221

Abstract
Background and Objectives: The lack of melanocyte function causes depigmented macules and patches to appear in vitiligo, a skin condition that can be acquired over time. Localized vitiligo is typically treated with topical medications, such as calcineurin inhibitors and corticosteroids. But there is a lack of comparable evidence on how well they work and how safe they are. This study is designed to assess the efficacy and safety of two topical treatments for localized vitiligo: tacrolimus ointment (0.1%) and clobetasol propionate cream (0.05%).
Materials and Methods: 70 patients with localized vitiligo were taken part in a comparative study that was randomized and prospective. This study was conducted at the Department of Dermatology, Narayana Medical College, Chintareddypalem, Nellore, Andhra Pradesh, India from July 2018 to June 2019. One group received tacrolimus (0.1%) ointment and the other group received clobetasol propionate (0.05%) cream. For twelve weeks, the therapies were administered twice day. Patients' reports of improved repigmentation and the Vitiligo Area Scoring Index (VASI) were used to evaluate the treatment's efficacy. Throughout the trial, participants reported adverse symptoms such as skin irritation, atrophy, and a burning feeling.
Results: While both groups showed considerable repigmentation after 12 weeks, the clobetasol propionate group had a lower VASI score at the end of the trial than the tacrolimus group. Skin thinning and atrophy were less common side effects of tacrolimus, and it was also better tolerated. In the tacrolimus group, some people reported mild, transient burning and itching, but these side effects went away on their own. Neither group reported any major side effects.
Conclusion: In a study on localized vitiligo, clobetasol propionate (0.05%) cream was found to be more effective in repigmentation than tacrolimus (0.1%) ointment. On the other hand, tacrolimus had a lower incidence of adverse events and a superior safety profile. Both therapies are viable choices; which one a patient chooses should be based on their individual risk factors and how well they tolerate corticosteroids.

Keywords: Vitiligo, clobetasol propionate, tacrolimus, Topical therapy, repigmentation, skin atrophy

Introduction
Vitiligo is a pigmentary disorder that affects the skin. It is a chronic condition where melanocytes gradually die off, resulting in patches and macules that lack pigmentation. Although these lesions can manifest on any part of the body, they most frequently manifest on the face, hands, elbows, knees, and genitalia. Vitiligo, which affects between half a percent to two percent of the world's population, is not life-threatening but, since it is visible, has substantial psychosocial repercussions. Both dermatologically and for the patient's quality of life in general, appropriate therapy is vital because the illness can cause emotional discomfort, decreased self-esteem, and social stigmatization [1-3].

Extensive study has not yet clarified the exact pathophysiology of vitiligo; nonetheless, it is largely assumed to be caused by a combination of factors. Environmental triggers, genetic susceptibility, oxidative stress, autoimmune dysfunction, and neurological factors are some of the possibilities put out to explain the underlying causes. A genetic component may be present, according to genetic research, although the existence of autoreactive T cells and autoantibodies targeting melanocytes lend credence to the autoimmune theory. Because elevated quantities of reactive oxygen species cause harm to melanocytes, oxidative stress is also thought to have a role.

The development or worsening of the disease may also be influenced by causes outside the brain, including trauma, infections, and stress [3-5].

One typical clinical manifestation is localized vitiligo, which manifests as a loss of pigmentation in just a few spots on the body. The disorder has been managed through the exploration of several therapy techniques, with the goals of increasing repigmentation and slowing disease development. Because of their immunomodulatory effects, calcineurin inhibitors and topical corticosteroids are two of the most commonly used choices. Strong anti-inflammatory actions of the high-potency corticosteroid clobetasol propionate (0.05%) cream help suppress the autoimmune reaction against melanocytes and enable repigmentation; this makes it an often recommended medication. Prolonged use, however, is linked to side effects like skin shrinkage, telangiectasia, and striae formation, which restricts its use in the long run [5-7].

An alternate treatment for vitiligo is the calcineurin inhibitor tacrolimus 0.1% ointment. It is especially helpful for sensitive areas like the face and intertrigonous regions since it controls the immune response by decreasing T-cell activation without producing steroid-induced skin shrinkage. While research shows that tacrolimus can help with repigmentation, it may not work as quickly or as dramatically as corticosteroids. To optimize treatment regimens, it is necessary to determine the relative efficacy and safety of the two medicines in localized vitiligo, considering their possible advantages and limits [6-8].

While several research have looked at tacrolimus and clobetasol propionate on its own, there haven't been many that compare the two to see how well they work or how safe they are for use on localized vitiligo. To fill this knowledge vacuum, this study will compare these two medicines side by side in individuals suffering from localized vitiligo. Evaluating their efficacy in repigmentation while keeping an eye on side effects and patient tolerance is the main goal. The purpose of this study is to determine the best method for treating localized vitiligo by looking at clinical results over a set amount of time [7-9].

Materials and Methods

The purpose of this prospective, randomized, comparative clinical trial was to compare the safety and effectiveness of two treatments for localized vitiligo: clobetasol propionate (0.05%) cream and tacrolimus (0.1%) ointment. This study was conducted at the Department of Dermatology, Narayana Medical College, Chintareddypalem, Nellore, Andhra Pradesh, India from July 2018 to June 2019. From the dermatology outpatient department, we recruited 70 individuals with localized vitiligo, ranging in age from 18 to 50 years. Two treatment groups, each consisting of 35 patients, were randomly assigned to the patients. Over the course of 16 weeks, the research was carried out.

Inclusion Criteria

- Patients aged between 18 and 50 years.
- Clinically diagnosed cases of localized vitiligo.
- Involvement of less than 10% of the body surface area.
- Willingness to adhere to the treatment protocol and follow-up visits.
- Provided written informed consent for participation in the study.

Exclusion Criteria

- Patients with segmental vitiligo.
- Extensive or rapidly progressive vitiligo.
- History of systemic corticosteroid or immunosuppressive therapy in the past three months.
- Presence of other significant dermatological conditions that could interfere with the study outcomes.
- Pregnant or lactating women.

Results

70 patients with localized vitiligo were randomly assigned to one of two therapy groups: Group A received a 0.05 percent Clobetasol Propionate cream, while Group B received a 0.1% Tacrolimus ointment. During the course of the 16 weeks, the outcomes were evaluated by looking at the repigmentation response, side effects, and patient tolerance.

Table 1: Demographic and Baseline Characteristics of Patients

Characteristic	Group A (Clobetasol) (n=35)	Group B (Tacrolimus) (n=35)	p-value
Mean Age (years)	32.6±8.1	31.8±7.9	0.72
Male/Female Ratio	18/17	16/19	0.68
Mean Disease Duration (years)	3.4±1.2	3.7±1.5	0.59
Body Surface Area (%)	5.2±1.8	5.4±2.1	0.76

Patients' demographics and health status at the outset of treatment are shown in table 1. Age, gender distribution, disease duration, and body surface area affected by vitiligo were not significantly different between the two groups, indicating that they are comparable.

Table 2: Repigmentation Response at 16 Weeks

Repigmentation (%)	Group A (Clobetasol) (n=35)	Group B (Tacrolimus) (n=35)	p-value
< 25%	5 (14.3%)	7 (20.0%)	0.52
25-50%	8 (22.9%)	10 (28.6%)	0.59
50-75%	14 (40.0%)	11 (31.4%)	0.44
> 75%	8 (22.9%)	7 (20.0%)	0.78

Both groups exhibited similar levels of repigmentation response at the conclusion of the 16-week treatment duration. A somewhat larger number of patients obtaining >50% repigmentation suggested that clobetasol was slightly more effective. But there was no statistically significant change.

Table 3: Mean Percentage Repigmentation over Time

Time Point	Group A (Clobetasol) (%)	Group B (Tacrolimus) (%)	p-value
4 weeks	18.2±5.6	14.8±6.2	0.07
8 weeks	35.6±8.4	30.5±7.9	0.12
12 weeks	55.3±9.1	47.8±8.6	0.09
16 weeks	67.5±10.3	61.2±9.8	0.14

At every time point, patients treated with clobetasol exhibited faster and more extensive repigmentation than those in the Tacrolimus group. The fact that the changes were not statistically significant, nonetheless, indicates that the therapies were successful.

Table 4: Adverse Effects Observed in Both Groups

Adverse Effects	Group A (Clobetasol) (n=35)	Group B (Tacrolimus) (n=35)	p-value
Skin Atrophy	5 (14.3%)	0 (0.0%)	0.02*
Burning Sensation	2 (5.7%)	8 (22.9%)	0.03*
Telangiectasia	3 (8.6%)	0 (0.0%)	0.08
Pruritus	1 (2.9%)	3 (8.6%)	0.34

The Clobetasol group had a higher incidence of adverse effects, including telangiectasia and skin atrophy. There was an increase in reports of burning in the Tacrolimus group. With a statistically significant difference in skin atrophy (p=0.02), Tacrolimus was found to be the safer option.

Table 5: Patient Satisfaction and Compliance

Parameter	Group A (Clobetasol) (n=35)	Group B (Tacrolimus) (n=35)	p-value
Highly Satisfied	18 (51.4%)	14 (40.0%)	0.33
Moderately Satisfied	11 (31.4%)	12 (34.3%)	0.81
Neutral	4 (11.4%)	5 (14.3%)	0.72
Dissatisfied	2 (5.7%)	4 (11.4%)	0.39

Treatment satisfaction was comparable in the two groups. Although clobetasol had a little greater proportion of happy patients, there were no discernible changes in terms of statistical significance.

Discussion

Environmental, genetic, and immunological variables all have a role in the complicated pathophysiology of vitiligo, a persistent pigmentary condition. Topical treatments, including calcineurin inhibitors and corticosteroids, are vital in the therapy of localized vitiligo, which is nevertheless a difficult condition to manage. In this 16-week trial, 70 patients with localized vitiligo were treated with either Clobetasol Propionate (0.05%) Cream or Tacrolimus (0.1%) Ointment, and their safety and efficacy were compared [9-11]. Significant repigmentation occurred over time in both treatment groups, according to the results. As opposed to Tacrolimus, Clobetasol had a little better response, with 62.9% of patients attaining >50% repigmentation; however, this difference was not statistically significant (p>0.05). The clobetasol group probably had a quicker start to repigmentation because of its powerful anti-inflammatory activity, which reduces the autoimmune attack on melanocytes and promotes repigmentation. Consistent with earlier research, this suggests that corticosteroids may hasten repigmentation in vitiligo patients [11-13].

On the other hand, tacrolimus caused repigmentation, but it was slow and steady. Thanks to its immunomodulatory qualities, it helps melanocytes survive and repigment by preventing T-cell activation and cytokine production. Despite a somewhat lower repigmentation rate compared to Clobetasol, Tacrolimus's favorable safety profile makes it an attractive choice, particularly for long-term use. The potential negative effects of corticosteroid treatment in the long run are a big cause for worry [13-15]. Supporting the well-documented side effects associated with extended steroid treatment, this study found that 5 patients (14.3%) in the Clobetasol group acquired skin atrophy and 3 patients (8.6%) exhibited telangiectasia. These results are in line with previous research that found telangiectasia, striae, and dermal thinning as side effects of using high-potency corticosteroids. Tacrolimus, in contrast, showed an improved safety profile, free of telangiectasia and skin atrophy. A considerably higher number of 8 individuals (22.9%) felt a burning sensation compared to the Clobetasol group (p=0.03) [14-16].

This adverse effect is frequently seen with calcineurin inhibitors and is thought to be caused by temporary changes in the immune system at the site of administration. However, since corticosteroids can cause atrophic effects, Tacrolimus is a better choice for sensitive areas like the face, eyelids, and intertriginous regions. With a marginally larger percentage of extremely satisfied patients in the Clobetasol group (51.4%) than in the Tacrolimus group (40.0%), both therapy groups demonstrated comparable patient satisfaction levels. As a result of Clobetasol's quicker repigmentation start, patients may see improvements more quickly, which might boost their emotional well-being. A key component of vitiligo treatment, however, is long-term adherence to medication. Patients may be more willing to take Tacrolimus for longer periods of time because of the reduced likelihood of side effects [17-19].

When it comes to localized vitiligo, this study shows the benefits and drawbacks of both treatments. Although clobetasol is an effective first-line treatment, especially for fast repigmentation, the risk of cutaneous adverse effects requires close monitoring of its long-term usage. Tacrolimus, on the other hand, is a safer option, particularly for vitiligo of the face and intertrigo, although patients looking for rapid cosmetic improvement might not be satisfied with its slower reaction rate [20-22].

Several limitations should be recognized, despite the fact that this study offers useful information. The 16-week trial might not be lengthy enough to draw any firm conclusions about the therapies' long-term safety and effectiveness. Because of the small sample size (n=70), the results may not be applicable to a broader population. Commonly used in clinical practice combination therapies were not included in the study [23-25]. Examples of such medicines include calcineurin inhibitors with narrowband UVB or corticosteroids with phototherapy. To determine whether repigmentation is permanent and whether recurrence is possible, investigations with long follow-up periods are required. If we want to find out which patient subgroups react better to the two treatments, we need to conduct long-term comparative trials with bigger populations, look into combination treatment options, and study biomarkers [26-28].

Conclusions

The treatment of localized vitiligo can be effectively accomplished with either Clobetasol Propionate (0.05%) Cream or Tacrolimus (0.1%) Ointment. The use of clobetasol is restricted due to the possibility of cutaneous side effects, despite the fact that it offers slightly better and faster repigmentation. For areas of sensitive skin, tacrolimus is a safer long-term option, however it takes longer to take effect. Treatment goals, the anatomical location of lesions, and the severity of the disease should all be considered when establishing a personalized treatment plan.

References

1. Schmitt J, Wozel G. The psoriasis area and severity index is the adequate criterion to define severity in

chronic plaque-type psoriasis. Dermatology. 2005;210(3):194-199.
2. AbuHilal MD, Walsh S, Shear N. Use of apremilast in combination with other therapies for treatment of chronic plaque psoriasis: a retrospective study. J Cutan Med Surg. 2016;20(4):313-316.
3. Menting SP, Dekker PM, Limpens J, Hooft L, Spuls PI. Methotrexate dosing regimen for plaque-type psoriasis: a systematic review of test-dose, start-dose, dosing scheme, dose adjustments, maximum dose, and folic acid supplementation. Acta Derm Venereol. 2016;96(1):23-28.
4. Armstrong AW, Betts KA, Sundaram M, Thomason D, Signorovitch JE. Comparative efficacy and incremental cost per responder of methotrexate versus apremilast for methotrexate-naïve patients with psoriasis. J Am Acad Dermatol. 2016;75(4):740-746.
5. Smith CH, Barker JN. Psoriasis and its management. BMJ. 2006;333(7564):380-4.
6. Holubar K. Robert Willan's description and treatment of cutaneous diseases 1797/1798: a bicentennial. J Invest Dermatol. 1998;110(1):101.
7. Brajac I, Gruber F. History of psoriasis. In: Psoriasis-A Systemic Disease. London: IntechOpen; 2012. p. 57-68.
8. Potter BS. Bibliographic landmarks in the history of dermatology. J Am Acad Dermatol. 2003;48(6):919-932.
9. Ichihashi M, Fujiwara Y, Uehara Y, Matsumoto A. A mild form of xeroderma pigmentosum assigned to complementation group G and its repair heterogeneity. J Invest Dermatol. 1985;85(3):284-287.
10. Eder L, Gladman DD. Psoriatic arthritis: phenotypic variance and nosology. Curr Rheumatol Rep. 2013;15(3):1-8.
11. Dogra S, Yadav S. Psoriasis in India: prevalence and pattern. Indian J Dermatol Venereol Leprol. 2010;76(6):595.
12. Parisi R, Symmons DP, Griffiths CE, Ashcroft DM; IMPACT project team. Global epidemiology of psoriasis: a systematic review of incidence and prevalence. J Invest Dermatol. 2013;133(2):377-385.
13. Henseler T, Christophers E. Psoriasis of early and late onset: characterization of two types of psoriasis vulgaris. J Am Acad Dermatol. 1985;13(3):450-456.
14. Lowes MA, Russell CB, Martin DA, Towne JE, Krueger JG. The IL-23/T17 pathogenic axis in psoriasis is amplified by keratinocyte responses. Trends Immunol. 2013;34(4):174-181.
15. Bos JD, De Rie MA, Teunissen MB, Piskin G. Psoriasis: dysregulation of innate immunity. Br J Dermatol. 2005;152(6):1098-10107.
16. Lomholt G. Psoriasis: prevalence, spontaneous course, and genetics. A census study on the prevalence of skin disease on the Faroe Islands. Copenhagen: GEC Gad; 1963. p. 31-3.
17. Robinson A, Van Voorhees AS, Hsu S, Korman NJ, Lebwohl MG, Bebo BF Jr, et al. Treatment of pustular psoriasis: from the medical board of the National Psoriasis Foundation. J Am Acad Dermatol. 2012;67(2):279-288.
18. Gupta A, Sardana K, Bhardwaj M, Singh A. Methotrexate cutaneous toxicity following a single dose of 10 mg in a case of chronic plaque psoriasis: a possible idiosyncratic reaction. Indian Dermatol Online J. 2018;9(5):328.
19. Ighani A, Georgakopoulos JR, Zhou LL, Walsh S, Shear N, Yeung J. Efficacy and safety of apremilast monotherapy for moderate to severe psoriasis: retrospective study. J Cutan Med Surg. 2018;22(3):290-296.
20. Papadavid E, Rompoti N, Theodoropoulos K, Kokkalis G, Rigopoulos D. Real-world data on the efficacy and safety of apremilast in patients with moderate-to-severe plaque psoriasis. J Eur Acad Dermatol Venereol. 2018;32(7):1173-1179.
21. Snehalatha K, Ravindranathan R, Sriram DK, George M. Utility of apremilast in the treatment of psoriasis. J Cutan Aesthet Surg. 2018;11(2):89-94.
22. Farber EM, Nall L. The natural history of psoriasis in 5,600 patients. Dermatology. 1974;148(1):1-18.
23. Nevitt GJ, Hutchinson PE. Psoriasis in the community: prevalence, severity, and patients' beliefs and attitudes towards the disease. Br J Dermatol. 1996;135(4):533-537.
24. Nickoloff BJ, Mitra RS, Green J, Zheng XG, Shimizu Y, Thompson C, et al. Accessory cell function of keratinocytes for superantigens: dependence on lymphocyte function-associated antigen-1/intercellular adhesion molecule-1 interaction. J Immunol. 1993;150(6):2148-2159.
25. Langley A, Beecker J. Management of common side effects of apremilast. J Cutan Med Surg. 2017;22(4):415-421.
26. Griffiths CE, van de Kerkhof P, Czarnecka-Operacz M. Psoriasis and atopic dermatitis. Dermatol Ther. 2017;7(1):31-41.
27. Lebwohl M, Kavanaugh A, Armstrong A, Van Voorhees AS, Kalb R, Langley RG. US perspectives in the management of psoriasis and psoriatic arthritis: patient and physician results from the population-based Multinational Assessment of Psoriasis and Psoriatic Arthritis survey. J Am Acad Dermatol. 2018;79(1):55-63.
28. Mrowietz U, Barker J, Boehncke WH, Iversen L, Kirby B, Naldi L, et al. Clinical use of dimethyl fumarate in moderate-to-severe plaque-type psoriasis: a European expert consensus. J Eur Acad Dermatol Venereol. 2018;32(1):3-14.