DOI: https://doi.org/10.54393/pjhs.v4i11.1168

PAKISTAN JOURNAL OF HEALTH SCIENCES

https://thejas.com.pk/index.php/pjhs

Volume 4, Issue 11 (November 2023)

Original Article

Comparative Efficacy of Topical Tacrolimus 0.1% and Clobetasol Propionate 0.05% in the Treatment of Alopecia Areata (AA)

Danyal Sajjad[1*], Bushra Muzaffar[1], Muhammad Adeel Siddiqui[1], Majid Hussain[1], Sana Aslam[1] and Huma Farid[1]

[1]Department of Dermatology, Combined Military Hospital, Abbottabad, Pakistan

ARTICLE INFO

Key Words:

Alopecia Areata, Clobetasol Propionate, Tacrolimus

How to Cite:

Sajjad, D., Muzaffar, B., Siddiqui, M. A., Hussain, M., Aslam, S., & Farid, H. (2023). Comparative Efficacy of Topical Tacrolimus 0.1% and Clobetasol Propionate 0.05% in the Treatment of Alopecia Areata (AA) : Efficacy of Tacrolimus and Clobetasol Propionate in the Treatment of Alopecia Areata . Pakistan Journal of Health Sciences, 4(11). https://doi.org/10.54393/pjhs.v4i11.1168

***Corresponding Author:**

Danyal Sajjad
Department of Dermatology, Combined Military Hospital, Abbottabad, Pakistan
danyalsajjad875@gmail.com

Received Date: 6th November, 2023
Acceptance Date: 26th November, 2023
Published Date: 30th November, 2023

ABSTRACT

Alopecia areata patients can choose from a variety of therapy methods. Each method has advantages and limitations, and its suitability varies for each patient. The medical usefulness of topical corticosteroids in AA is yet debatable. **Objective:** To assess the effectiveness of topical tacrolimus 0.1% vs. topical clobetasol propionate 0.05% while treating alopecia areata. **Methods:** Randomized-controlled trial (Double blind) conducted in Dermatology Department, CMH-Abbottabad, from November 2022 to April 2023. The seventy (70) patients with alopecia areata who attended to OPD of CMH Abbottabad between the ages of 20 and 50 were included. The non-probability consecutive sampling method was used. For up to 3 months, patients in Group A used clobetasol propionate 0.05% twice daily, while patients in Group B used topical tacrolimus 0.1% twice daily. Patients were evaluated at the start of each session, four weeks later, eight weeks later, and twelve weeks later. The SALT score was used to estimate hair loss at presentation and during the 3-month follow-up. The degree of response has been characterized by following hair re-growth as excellent (>75%), marked (51-75%), moderate (26-50%), or mild (25%). A p-value of <0.05 was considered significant. **Results:** When the efficacy was compared, 26 (74.3%) patients in group-A (mean age 35.23+7.87 years) shown excellent response, while 14 (40%) patients in group-B (mean age 34.29+7.87 years) with significant p-value was 0.028. **Conclusions:** Clobetasol propionate 0.05% was more efficacious as a therapy choice for stimulating hair re-growth in patients.

INTRODUCTION

An autoimmune disorder called alopecia areata (AA) causes non-scarring hair loss in areas [1]. It also has impact on psychological well-being and daily life [2]. The majority of patients describe a sudden start of one or more well-defined, one to four cm circular regions of scalp hair loss. The presence of broken "exclamation-mark" hairs and short hairs that taper proximally is a typical trait [3]. Some Alopecia areata patients also have nail pitting [4]. The condition can affect any hair-bearing region, although the scalp, brows, eyelashes, and beard are the most usually affected. Hair loss can be spotty or widespread [5]. The severity of alopecia areata is classified into four categories by the National Alopecia Areata Foundation Guidelines Committee: none (S0), 1 to 24 percent (S1), 25 to 49 percent (S2), 50 to 74 percent (S3), 75 to 99 percent (S4), and 100%. The SALT SCORE is a global severity score that considers hair percentage. The scalp is split into four regions based on its surface area. The top of the scalp provides 40%, the posterior of the scalp 24%, the right side of the scalp 18%, and the left side of the scalp 18% [6]. Although the cause of Alopecia areata is uncertain, most evidence suggests that the illness is immunologically mediated [7]. AA is a frequent yet difficult problem to treat in dermatology [8]. Intralesional corticosteroid treatment is being investigated for limited scalp AA and specialists recommend it as the medicine of choice. Corticosteroids applied topically has been shown to be beneficial for moderate-to-severe AA. Folliculitis is a frequent

DOI: https://doi.org/10.54393/pjhs.v4i11.1168

complication of topical corticosteroids. Telangiectasia and atrophy are uncommon. However, the primary downsides of these techniques are their limited effectiveness, local and systemic adverse effects, particularly in long-term therapy [9]. Tacrolimus might be an effective therapeutic option of management of inflammatory dermatological diseases, including alopecia areata [10]. Alopecia areata patients can choose from a variety of therapy methods. Each method has advantages and limitations, and its suitability varies for each patient. The medical usefulness of topical corticosteroids in AA is yet debatable. This literature on this topic is limited that is why this study is conducted with objective of to compare clobetasol with tacrolimus while treating AA. This study will also help to assess relative effectiveness of clobetasol and tacrolimus in treatment of alopecia areata.

METHODS

A RCT study was conducted in dermatology dept of the CMH, Abbottabad from November 2022 to April 2023 after Ethical Review Board approval dated 01-Nov-2022 (Reg#CMHAtd-ETH-56-Derma-22) and RCT (Reg#ClinicalTrials.gov Identifier NCT05885269). The seventy (70) patients who were 20-50 years of age diagnosed as alopecia areata on clinical grounds, confirmed by consultant dermatologist and further examination of plucked hair was done under a microscope. An inform consent was taken. The method of non-probability consecutive sampling was applied. The sample size was estimated using WHO sample size calculator by taking a 95% confidence interval, an 80% power of study, and an expected cure rate of 44.82% for Tacrolimus and 79.31% for Clobetasol propionate. The calculated sample size was 62, with 31 in each group, however a sample size of 70 (35 in each group) was used to boost the study's validity [11]. The study included patients aged between 20-50 years, both gender, who attended the dermatology out-patient department of CMH Abbottabad, had an ailment lasting less than 2 months, and had never had any treatment before. On the other hand, Patients with history of more than 2 months alopecia areata, atypical AA (e.g., Alopecia universalis), a history of hypersensitivity to drugs such as topical corticosteroids and tacrolimus, patients on systemic immune-suppression, and females who are pregnant or on lactation were excluded. Patients' randomization was done by lottery method. Those in Group-A treated clobetasol propionate 0.05% twice a day, whereas those in Group-B treated topical tacrolimus 0.1% two times a day for up to 3 months. A thorough medical history and physical examination, together with an inspection of all hair-bearing regions and nails, were performed at the patient's initial appointment. Patients were given full information on the disease as well as the lapsing nature of AA. The information is also provided on prognosis, and risk/benefit ratio options, in an Urdu or local language, an informed written consent was also obtained. Face-to-face interviews were used to collect data. The effectiveness of therapy was assessed using photos of patients before and after the trial, as well as clinical examination of patients. The clinical response was assessed four weeks, eight weeks, and twelve weeks following the conclusion of therapy. The clinical comparisons were made at every follow-up appointment and at the end of the treatment clinically by me and by consultant dermatologist. All patients' findings were assessed at 4th, 8th, and 12th week duration of following therapy completion. The hair re-growth score was determined using the SALT score at presentation and the SALT score (0 to 4) during the 3-month follow-up as follows: 0 (10% re-growth), 1 (11-25% re-growth), 2 (26-50%), 3 (51-75%), and 4 (>75% re-growth). The response was categorized on examining hair re-growth which was labelled excellent upon (>75%), Marked (51% to 75%), moderate (26% to 50%), or slight (≤ 25%). The statistical program for social sciences (SPSS) version 23.0 was used for analysis. Mean ± SD was determined for continuous data, while frequency percentages were calculated for categorical variables. To evaluate statistical significance for treatment efficacy evaluation, the chi-square test was utilized, with a p-value of 0.05 considered significant.

RESULTS

In group-A mean age was 35.23±7.87 years, and in group-B mean age was 34.29±7.87 years. The two groups were well-evaluated in terms of pre-treatment clinical parameters there was significant relations between gender (p=0.034) and number of lesions (p=0.015) in group-A and Group-B. The majority 46(65.7%) patients were greater than 31 years of age, hence 50(71.4%) were males between both groups of Alopecia areata. The 42(60%) patients of single lesions were effectively treated by both the treatment groups (Table 1).

Table 1: Clinical Parameters of both treatment Groups (n=70)

Variables		Categories	Group-A N (%)	Group-B N (%)	Total N (%)	p-value
Age (years)	20-30	Early Adulthood	11 (31.4%)	13 (37.1%)	24 (34.3%)	0.615
	31-50	Middle Adulthood	24 (68.6%)	22 (62.9%)	46 (65.7%)	
Gender		Mean ± SD	35.23±7.87	34.29±7.87	-	
		Male	21(60%)	29(82.9%)	50(71.4%)	0.034
		Female	14(40%)	6(17.1%)	20(28.6%)	
Number Of Lesions		Single	16(45.7%)	26(74.3%)	42(60%)	0.015
		Multiple	19(54.3%)	09(25.7%)	28(40%)	

In Table 2, while comparing the efficacy, in group-A

DOI: https://doi.org/10.54393/pjhs.v4i11.1168

26(74.3%) patients showed excellent response as compared to 14(40%) patients in group-B ($p<0.05$). whereas remaining patients of Group A showed 5 (14.3%) marked, 3(8.6%) moderate, 1(2.8%) slight dose response. The rest of group B showed marked, moderate and slight response to the dose as 15(42.9%), 4(11.4%) 2(5.7%) respectively. There is significant relationship between both the treatment group which showed that clobetasol propionate of group A had significant difference than the group B topical Tacrolimus 0.01% ($p=0.028$).

Table 2: Treatment efficacy between both Groups at end of treatment(n=70)

Variables		Group A vs. Group B		p-value
		Group A	Group B	
Grades of response	Excellent (>75% re-growth)	26(74.3%)	14(40%)	0.028
	Marked (51-75% re-growth)	5 (14.3%)	15(42.9%)	
	Moderate (26-50% re-growth)	3(8.6%)	4(11.4%)	
	Slight (≤25% re-growth)	1(2.8%)	2(5.7%)	
Total		35(100%)	35(100%)	

DISCUSSION

In our study, topical clobetasol propionate 0.05% was used to treat 35 patients in group-A while topical tacrolimus 0.1% was used to treat 35 patients in group-B. In terms of age distribution, both groups included a majority of people who were 31 to 50 years of age. The duration of sickness was essentially comparable across the two groups as majority of the patients had less than 2 months of illness duration. The study showed that topical clobetasol propionate 0.05% had 74.3% excellent response as compared to the topical tacrolimus 0.1% i.e., 40% which is similar to the study conducted in 2022 by Ullah et al., [11]. Sotiriou et al., studied the effect of topical tacrolimus 0.1% as 45% for active patchy alopecia areata which is quite close to our 40% excellent response in adult patients [12]. Thus, another study by Rokhsar et al., find out 70% topical efficacy of clobetasol propionate while treating alopecia areata but in this study we find out 74% efficacy which is better than the study conducted by Rokhsar et al., [13]. In this study only 4 (11.43%) patients treated with clobetasol propionate Vs. 6(17.14%) patients treated with Tacrolimus 0.1% reported less than 50% improvement during this trial, opposed to 79.4% patients treated with clobetasol and 76.5% patients in the study of Hossain et al., [14, 15]. The determinants of the study were age, gender and number of lesions. There was insignificant difference for age [16] between both groups except gender, number of lesions which showed significant difference which is similar to the study conducted by You et al., [17]. On the contrary, in a meta-analysis suggests that AA is also associated with systemic and psychiatric diseases also. Therefore, Physicians are highly encouraged to assess and manage co-morbidities to get better outcomes [18, 19]. Chanprapaph et al., studied that gender male was the risk factor of alopecia areata which is similar to our study in which most of the patients were male and statistically significant difference was seen as p-value 0.034 [20], but in some studies reported that both genders are equally diagnosed with AA. In group-A 28(40%) patients suffered multiple number of lesions as compared to group-A 09(25.7%) patients. Despite large number of patients suffering multiple lesions in group-A, Clobetasol propionate's efficacy is markedly more than the topical tacrolimus to treat multiple lesions effectively. This comparative efficacy advantage of using clobetasol is more support use of in clinical practice in severe AA. Thereby this study was conducted to compare the efficacy of both groups in order to better treat alopecia (AA) patients and provide informed treatment by following evidence-based practice.

CONCLUSIONS

Topical clobetasol propionate 0.05% was more efficacious as a therapy choice for stimulating hair re-growth among patients of alopecia areata. It also treats multiple lesions effectively as compared to tacrolimus. The treatment is compliant to all patients.

Authors Contribution

Conceptualization: DS, BM
Methodology: SA, HF
Formal analysis: DS, MAS, MH
Writing-review and editing: DS, SA, HF

All authors have read and agreed to the published version of the manuscript.

Acknowledgement

This study was supported by Nutrition Division of NIH and we are thankful to Chief Nutrition Division of NIH and Executive Director of NIH.

Conflicts of Interest

The authors declare no conflict of interest.

Source of Funding

The authors received no financial support for the research, authorship and/or publication of this article.

REFERENCES

[1] Gharib K and Elsayed A. Serum level of interleukin-17A in patients with alopecia areata and its relationship to age of patients and disease recurrence. Egyptian Journal of Dermatology and Venerology. 2021 Jul; 41(2): 83. doi: 10.4103/ejdv.ejdv_24_20.

[2] Rehman S and Jameel R. Appearance anxiety and loneliness: the mediating role of rejection sensitivity in patients with alopecia areata in Lahore Pakistan.

DOI: https://doi.org/10.54393/pjhs.v4i11.1168

JPMA. The Journal of the Pakistan Medical Association. 2023 Apr; 73(4): 800-3. doi: 10.47391/JPMA.6302.

[3] Malakar S, Banerjee U, Mehta P, Mukherjee S, Sardar S, Malakar S, et al. Trichoscopy. Atlas of Dermatology, Dermatopathology and Venereology: Cutaneous Anatomy, Biology and Inherited Disorders and General Dermatologic Concepts. 2021 Oct: 295-322. doi: 10.1007/978-3-319-53811-2_93.

[4] Al-Hamamy HR and Al-Ani GN. Nail Changes in Alopecia Areata and Their Correlation with Disease Severity. Iraqi Postgraduate Medical Journal. 2021; 20(2): 128-35.

[5] Zhou C, Li X, Wang C, Zhang J. Alopecia areata: an update on etiopathogenesis, diagnosis, and management. Clinical Reviews in Allergy & Immunology. 2021 Dec; 61(3): 403-423. doi: 10.1007/s12016-021-08883-0.

[6] Olsen EA, Hordinsky MK, Price VH, Roberts JL, Shapiro J, Canfield D, et al. Alopecia areata investigational assessment guidelines–Part II. Journal of the American Academy of Dermatology. 2004 Sep; 51(3): 440-7. doi: 10.1016/j.jaad.2003.09.032.

[7] Simakou T, Butcher JP, Reid S, Henriquez FL. Alopecia areata: A multifactorial autoimmune condition. Journal of Autoimmunity. 2019 Mar; 98: 74-85. doi: 10.1016/j.jaut.2018.12.001.

[8] Fukuyama M, Ito T, Ohyama M. Alopecia areata: Current understanding of the pathophysiology and update on therapeutic approaches, featuring the Japanese Dermatological Association guidelines. The Journal of Dermatology. 2022 Jan; 49(1): 19-36. doi: 10.1111/1346-8138.16207.

[9] Meah N, Wall D, York K, Bhoyrul B, Bokhari L, Sigall DA, et al. The Alopecia Areata Consensus of Experts (ACE) study: Results of an international expert opinion on treatments for alopecia areata. Journal of the American Academy of Dermatology. 2020 Jul; 83(1): 123-30. doi: 10.1016/j.jaad.2020.03.004.

[10] Umar BU, Rahman S, Dutta S, Islam T, Nusrat N, Chowdhury K, et al. Management of Atopic Dermatitis: The Role of Tacrolimus. Cureus. 2022 Aug; 14(8): e28130. doi: 10.7759/cureus.28130.

[11] Ullah F, Dawood M, Noor N, Hameed S. Efficacy of Topical Clobetasol Propionate 0.05% Ointment and Topical Tacrolimus 0.1% Ointment in Treatment of Alopecia Areata.: RCT. Pakistan Journal of Medical & Health Sciences. 2022 Jun; 16(06): 133. doi: 10.53350/pjmhs22166133.

[12] Sotiriou E, Patsatsi A, Fotiadou C, Sotiriadis D, Panagiotidou D. Tacrolimus ointment 0.1% in the treatment of active patchy alopecia areata of childhood. European Journal of Pediatric Dermatology. 2007 Dec; 17(4): 227-30.

[13] Rokhsar CK, Shupack JL, Vafai JJ, Washenik K. Efficacy of topical sensitizers in the treatment of alopecia areata. Journal of the American Academy of Dermatology. 1998 Nov; 39(5): 751-61. doi: 10.1016/S0190-9622(98)70048-9.

[14] Hossain MS, Miah MT, Khan MZ, Khondker L, Hasan MR. Efficacy of topical tacrolimus 0.1% and clobetasol propionate 0.05% in the treatment of alopecia areata. Journal of Pakistan Association of Dermatologists. 2015; 25(3): 197-201.

[15] Shakhawat H, Titu M, Zulfiqur Hossain K, Lubna K, Rashidul H. Efficacy of topical tacrolimus 0.1% and clobetasol propionate 0.05% in the treatment of alopecia areata. Journal of Pakistan Association of Dermatologists. 2016 Nov; 25(3): 197-201.

[16] Alshahrani AA, Al-Tuwaijri R, Abuoliat ZA, Alyabsi M, AlJasser MI, Alkhodair R. Prevalence and clinical characteristics of alopecia areata at a tertiary care center in Saudi Arabia. Dermatology Research and Practice. 2020 Mar; 2020: 7194270. doi: 10.1155/2020/7194270.

[17] You HR and Kim SJ. Factors associated with severity of alopecia areata. Annals of Dermatology. 2017 Oct; 29(5): 565-70. doi: 10.5021/ad.2017.29.5.565. .

[18] Lee S, Lee H, Lee CH, Lee WS. Comorbidities in alopecia areata: a systematic review and meta-analysis. Journal of the American Academy of Dermatology. 2019 Feb; 80(2): 466-77. doi: 10.1016/j.jaad.2018.07.013.

[19] Mian M, Silfvast-Kaiser A, Paek S, Kivelevitch D, Menter A. A review of the most common dermatologic conditions and their debilitating psychosocial impacts. International Archives of Internal Medicine. 2019 Jul; 3: 18. doi: 10.23937/2643-4466/1710018.

[20] Chanprapaph K, Mahasaksiri T, Kositkuljorn C, Leerunyakul K, Suchonwanit P. Prevalence and risk factors associated with the occurrence of autoimmune diseases in patients with alopecia areata. Journal of Inflammation Research. 2021 Sep; 14: 4881. doi: 10.2147/JIR.S331579.