Original Article

Efficacy of Short Contact 1.5% Dithranol Therapy in Mild to Moderate Alopecia Areata in Patients Reporting to Tertiary Care Hospital Karachi

Bahram Khan Khoso and Azam Jah Samdani

ABSTRACT

Objective: To evaluate the effectiveness of short contact 1.5% dithranol in the local population's alopecia areata sufferers.

Study Design: Trial study

Place and Duration of Study: This study was conducted at the Karachi, Pakistan's leading tertiary care hospitals, Jinnah Postgraduate Medical Centre (JPMC) from October, 2021 to August, 2022.

Materials and Methods: Twenty (20) patients were enlisted from the dermatology department of one of Karachi, Pakistan's tertiary care hospitals (JPMC) after receiving ethical approval, and they received treatment with 1.5% dithranol. Short demographic information and the mean SALT score were recorded. Total duration of therapy was 8 months. The effectiveness of the treatment was evaluated together with the hair regrowth score.

Results: There were 8/20 (40%) females and 12/20 (60%) men, ranging in age from 18 to 50 (Mean=29.75 ±10.19 years), with an illness duration of 1 to 12 months (Mean=5.05 ±3.02 months). Mean Salt score was 2.7±0. At 3, 6, and 8 months, the mean scores for hair regrow were 1.3±1.03, 1.9±1.12, and 2.1±1.25, respectively. However, 25% of patients had partial hair growth at 3 months. Treatment effectiveness was 15% after three months, 30% after six months, and 45% after eight months, respectively

Conclusion: For longer treatment periods, topical brief contact 1.5% dithranol's effectiveness was found to improve. Yet, to determine the effectiveness of treatment, lengthy therapy and extensive comparison studies more accurately are required.

Key Words: Alopecia areata, Dithranol, Efficacy, Short Contact

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INTRODUCTION

The autoimmune disease alopecia areata (AA), which affects hair follicles and occasionally nails, is organ-specific. Its etiopathogenesis mostly involves T cells.[1] The characteristic exclamation mark hair and well-defined hairless patches with ovoid or circular shape are its defining features.[2] In the past, intrusive methods, like punch biopsy, were used to confirm questionable cases.

These methods could occasionally be problematic, especially in children[3]. Although the aetiology and pathophysiology of alopecia areata are unknown, genetic factors, familial history, atopy, specific and non-specific immune responses, mental stress, viral or bacterial infections, and neurological components have all been linked to the condition's onset.[4]

The unpredictable course and inconsistent response to treatment make managing alopecia areata a significant issue for medical experts.[5] The hair cycles are subsequently shortened in AA, with the hair follicle frequently being interrupted mid-anagen as a result of an unidentified signal or injury precipitating the hair follicle suddenly into telogen phase.[6] Although the disorder is neither severe nor life-threatening, it nevertheless creates cosmetic anxiety, a loss of self-esteem, and a change in one's self-image because one's hair plays a significant role in their identity and self-image. Patients with alopecia areata have a severely diminished quality of life, which makes it difficult for them to carry out their daily tasks and creates a significant social stigma. Several research have revealed that people with alopecia areata frequently experience interpersonal interaction difficulties, inadequate social support, and high levels of alexithymic behaviour. People struggle with a variety of mental illnesses, such as anxiety and depression.[7,8] Patient response to treatment varies greatly due to the unpredictable course of the disease, with some patients with patchy alopecia areata responding to therapy or

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experiencing spontaneous remission while others develop alopecia totalis or universalis. [4,9] There are several methods that can be used to encourage hair growth in AA, each with their own benefits and drawbacks.[9,10] The effectiveness of currently available treatments, as well as the course and prognosis of the disease, are all unknowns. Leaving the condition untreated may seem sensible in patients with restricted patchy AA for less than a year because spontaneous remission occurs in about 50% of cases. [11,12] Topical steroids, tacrolimus, anthralin, minoxidil, tretinoin, calcipotriol, light and laser therapy, various systemic immunosuppressive medications, and topical immunotherapy agents are some of the treatment options that are available.[9,13] A study found that 5% minoxidil had a 72.5% efficacy rate.[14] Another study found that 33.4% of individuals receiving anthralin treatment experienced >50% terminal hair regrowth.[15]
While there isn't much information from clinical trials available in our region of the world regarding this therapy modality, the purpose of our study was to evaluate the effectiveness of short contact 1.5% dithranol in alopecia areata patients. The results of this study will help determine whether or not this therapy can serve as a preferred, cost-effective treatment option.

MATERIALS AND METHODS

One of Karachi, Pakistan's leading tertiary care hospitals, Jinnah Postgraduate Medical Centre (JPMC), was the site of this research trial. People travel to this facility for treatment from all over Pakistan as well as from nearby nations like Afghanistan and the Islamic Republic of Iran. The trial was conducted for ten months, from October 2021 to August 2022. Prior to conducting this investigation, permission from the institutional ethical review board was sought. All patients reporting with alopecia areata, and meeting inclusion criteria were included. After the patient signed an informed permission form, a brief history, and demographic data (age, gender, and disease duration) were recorded. To count the number of scalp patches and determine the Severity of Alopecia Tool (SALT) score (defined as S0 as no hair loss; S1 as <25% hair loss; S2 as 26-50% hair loss; S3 as 51-75% hair loss; S4 ss 76-99% hair loss; S5 for any patients having 100% hair loss)[16], a thorough clinical examination was conducted. Patients were properly guided about the correct method of application of short contact 1.5% dithranol therapy. Dithranol application concentration and contact time were steadily increased for patients, reaching a maximum concentration of 1.5% and contact time of 30 minutes. They received proper instruction on how to apply dithranol and how to remove it from the treated area using liquid soap for the purpose of thoroughly cleansing. It was encouraged to stick to using non-medicated hypoallergenic shampoo. Patients were checked in with regularly spaced intervals at 3, 6 and 8 months for evaluation of the efficacy (defined as >50% hair regrowth in a patch) and hair regrow score (defined as 0 showing less than <10% hair regrowth, 2 showing 11-25% regrowth, 3 showing 51-75% hair regrowth and for regrowth of hair of >75% as 4). The results of the qualitative variables (gender, patches number, SALT score grades, occupational status, family history, and efficacy) and the quantitative data (age and duration of the illness) were entered in Performa.

Statistical Analysis: Data analysis was performed using SPSS Version 24. Using the mean and standard deviation (SD), quantitative variables such as age, alopecia areata duration, SALT score ranges, and hair regenerate score ranges were evaluated. Frequencies and percentages were calculated for the qualitative factors such as gender, number of patches, SALT score grades, occupational status, family history, and efficacy (Yes/No).

RESULTS

Our study population included total 20 individuals of sexes, 12 (60%) males and 8 (40%) females. The minimum age and maximum age was 18 years and 50 years respectively with the mean of 29.75±10.19 SD (Table 1). The minimum duration of illness was 1 month and a maximum duration of disease was 12 months with the mean of 5.05±3.02 SD months. (Table 1). SALT score range was 2-4 with mean of 2.7±0.80 (Table 1). 3/20 subjects in our study (15%) had a family history of alopecia areata.
10/20 patients in our study group had less than 25% hair loss, 4/20 (20%) experienced 51-75% hair loss, and 5/20 (25%) had less than 2 patches. (Table 2).
At three months, the hair regrowth score revealed that 5/20 (25%) patients had 26-50% hair regrowth while 3/20 (15%) patients had 51-75% hair regrowth. While at the 6- and 8-month follow-ups, 7/20 (35%) vs. 5/20 (25%) patients had regrown between 26 and 50% of their hair, 5/20 (25%) vs. 7/20 (35%) patients had regrown between 51 and 75% of their hair, and 1/20 (5%) vs. 2/20 (10%) patients had regrown more than 75% of their hair, respectively (Table.3).

Table No.1: Demographic features of study subjects (n=20)

Age		Duration/Months		Gender		SALT	
Range	**Mean ± SD**	**Range**	**Mean ± SD**	**Male**	**Female**	**Range**	**Mean ±SD**
18-50	29.75 ±10.19	1-12	5.05 ±3.02	12 (60%)	8 (40%)	2-4	2.7 ±0.80

Table No.2: SALT Score and number of patches of study subjects (n=20)

SALT score			Number of patches	
Percentage of hair loss	Frequency	Percentage	<2 patches	>2 patches
<25% hair loss	10	50	5(25%)	15(75%)
26-50% hair loss	6	30		
51-75% hair loss	4	20		
76-99% hair loss	0	0		

Table No.3: Hair Regrowth score of study subjects at different intervals (n=20)

	3 Months		6 Months		8 Months	
HRS	**Frequency**	**Percentage**	**Frequency**	**Percentage**	**Frequency**	**Percentage**
Regrowth <10%	5	25	3	15	3	15
Regrowth 11-25%	7	35	4	20	3	15
Regrowth 26-50%	5	25	7	35	5	25
Regrowth 51-75%	3	15	5	45	7	35
Regrowth >75%	0	0	1	5	2	10

At 3, 6, and 8 months, the treatment's effectiveness was seen in 3/20 (15%), 6/20 (30%), and 9/20 (45%) patients, respectively. At an 8-month follow-up in our trial, 3/20 subjects (15%) displayed adverse effects.

Table No.4: Range and mean of Hair Regrowth score, Efficacy, and side effects (n=20)

Hair Regrow	Score	Efficacy		Side effects	
After 3 Months		Yes	No	Yes	No
Range	0-3	3 (15%)	17(85%)	1(5%)	19 (95%)
Mean ± SD	1.3±1.03				
After 6 Months					
Range	0-4	6 (30%)	14 (70%)	1(5%)	19 (95%)
Mean ± SD	1.9±1.12				
After 8 Months					
Range	0-4	9 (45%)	11 (55%)	3 (15%)	17 (85%)
Mean ± SD	2.1±1.25				

DISCUSSION

One of the common polygenic autoimmune illnesses, alopecia areata progresses in different people very differently. Although many patients may experience spontaneous remission, about 40% will experience a chronic relapsing course, which significantly lowers their quality of life).[17] As a result, choosing the optimum therapy method presents a constant problem for clinicians. Patients with high disease activity will need aggressive management, and the treatment should take into account their quality of life, illness severity, and drug safety.[18] Although there is no universally accepted course of treatment, topical or intralesional steroids are the first line of treatment for people with patchy alopecia areata.[19,20]

The likelihood of spontaneous remission, which may happen in 80% of patients with moderate disease, is one of the significant confounding factors in determining the effectiveness of any medicine in treating this condition during clinical trials.[11] Less encouraging information, however, comes from secondary and tertiary hospitals, where 34-50% of patients report spontaneous remission within a year.[21] Our investigation was carried out in a referral hospital, with patients with mild to moderate illness making up the study population.

We assessed the effectiveness of 1.5% dithranol for the treatment of scalp alopecia areata. In-depth drug use counselling was conducted. Therapy was tested for eight months; efficacy and hair regrowth score were evaluated at 3, 6, and 8 months. In three months, our results demonstrated 15% efficacy (> 50% hair re-growth), which rose to 30% at six months and 45% at eight months. However, at 3, 6, and 8 months, 25%, 35%, and 25% of our patients, respectively, noticed partial hair regrowth (>26-50%). The majority of our respondents initially had low SALT scores. Our results were consistent with those of earlier investigations, including non-randomized control trials and retrospective series.[22,23] Nevertheless, Ozedenir & Balevi (2017) observed early response at 3 months and partial regrowth of hair in 36.66% of patients at 9–12 months in a randomized control trial conducted in children with severe refractory alopecia areata with 1% dithranol. At 6 months, 6.66% of their patients showed complete response, and at 9 and 12 months, those numbers rose to 23.3% and 33.4%, respectively.[15] Whereas in our study, at 6 and 8 months, respectively, 30% and 45% of participants experienced more than 50% hair regrowth. This variation might result from different dithranol strengths being utilized and different patient types being chosen. They chose patients with refractory alopecia areata, whereas we had more patients with mild to moderate alopecia areata. One third of patients with low to moderate disease had a complete response at 6-7 months, whereas patients with severe disease took longer to respond, according to a large retrospective study that similarly confirmed this disparity in response according to severity. Higher concentration (3%) of dithranol was used as short - contact therapy.[24]

Using both the medicine anthralin and the drug azelaic acid, Sasmaz and Arican (2005) noticed therapeutic response earlier than our trial at 8 weeks; 56.2% of their patients in the anthralin group achieved complete

response at the 20th week as opposed to 53.3% in the azelaic group. But all of their study participants had patchy alopecia areata.[25]

All of our patients completed their treatment, and 15% of them experienced minor side effects. This is consistent with earlier investigations.[15] Nonetheless, in one study 13.33% of participants left due of excessive irritability.[22]

Dithranol has long been used to treat alopecia areata and psoriasis. With its immunomodulatory function, it operates by inhibiting IFN-γ and and TNF-α/β.[8,15,24] Data on the use of 1.5% dithranol concentration in the past are scarce; the most commonly utilised concentrations were 0.5%-1.25%. The severity and treatment results in earlier trials were also assessed inconsistently.[23]

CONCLUSION

The efficacy of short contact 1.5% dithranol for alopecia areata treatment improved when used for longer duration. However, long-term trials are needed to draw the comprehensive conclusion.

Author's Contribution:

Concept & Design of Study:	Bahram Khan Khoso
Drafting:	Azam Jah Samdani, Bahram Khan Khoso
Data Analysis:	Azam Jah Samdani
Revisiting Critically:	Bahram Khan Khoso, Azam Jah Samdani
Final Approval of version:	Bahram Khan Khoso

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. McElwee KJ, Gilhar A, Tobin DJ, Ramot Y, Sundberg JP, Nakamura M, et al. What causes alopecia areata? Section Editors: Ralf Paus, Manchester/Lübeck and Raymond Cho, San Francisco. Experimental Dermatol 2013;22(9): 609-26.
2. Spano F, Donovan JC. Alopecia areata: Part 1: pathogenesis, diagnosis, and prognosis. Canadian Family Physician 2015;61(9):751-5.
3. Ahmed I, Nasreen S, Bhatti R. Alopecia areata in children. Journal of the College of Physicians and Surgeons--pakistan: JCPSP 2007;17(10):587-90.
4. Pratt CH, King LE, Messenger AG, Christiano AM, Sundberg JP. Alopecia areata (Primer). Nature Reviews: Disease Primers 2017;3(1).
5. Hordinsky M, Junqueira AL. Alopecia areata update 34, 2. 2015;34(2):72-5.
6. Sardesai VR, Prasad S, Agarwal TD. A study to evaluate the efficacy of various topical treatment modalities for alopecia areata. Int J Trichol 2012;4(4):265.
7. Sellami R, Masmoudi J, Ouali U, Mnif L, Amouri M, Turki H, et al. The relationship between alopecia areata and alexithymia, anxiety and depression: a case-control study. Ind J Dermatol 2014;59(4):421.
8. Nasimi M, Ghandi N, Abedini R, Mirshamsi A, Shakoei S, Seirafi H. Efficacy and safety of anthralin in combination with diphenylcyclo-propenone in the treatment of alopecia areata: a retrospective case series. Archives Dermatological Res 2019;311:607-13.
9. Strazzulla LC, Wang EH, Avila L, Sicco KL, Brinster N, Christiano AM, et al. Alopecia areata: disease characteristics, clinical evaluation, and new perspectives on pathogenesis. J Am Acad Dermatol 2018;78(1):1-2.
10. Saleem A, Khan M, Mashori GR, SamdanI A, Kazmi SA. Comparison of effectiveness of topical tacrolimus and betamethasone with soft paraffin in the treatment of patchy alopecia areata. Pak J Med Sci 2009;25(5):833-6.
11. Ito T. Advances in the management of alopecia areata. J Dermatol 2012;39(1):11-7.
12. Alkhalifah A. Alopecia areata update. Dermatologic Clinics 2013;31(1):93– 108.
13. Barton VR, Toussi A, Awasthi S, Kiuru M. Treatment of pediatric alopecia areata: A systematic review. J Am Acad Dermatol 2021 Apr 30.
14. Zaib SR, Jabeen R, Fraz AA. Efficacy of topical 5% Minoxodil Solution in the Treatment of Alopecia Areata. Pak J Med Health Sci 2017;11:795-8.
15. Özdemir M, Balevi A. Bilateral half-head comparison of 1% anthralin ointment in children with alopecia areata. Pediatr Dermatol 2017;34(2):128-32.
16. Olsen EA, Hordinsky MK, Price VH, Roberts JL, Shapiro J, Canfield D, et al. Alopecia areata investigational assessment guidelines–Part II. J Am Acad Dermatol 2004;51(3):440-7.
17. Nasimi M, Ghandi N, Torabzade L, Shakoei S. Alopecia areata-quality of life index questionnaire (reliability and validity of the persian version) in comparison to dermatology life quality index. Int J Trichol 2020;12(5):227.
18. Rattananukrom T, Suchonwanit P. Are drug treatment strategies really effective against alopecia areata? Expert Opinion Pharmacotherapy 2021;22(3):257-60.
19. Darwin E, Hirt PA, Fertig R, Doliner B, Delcanto G, Jimenez JJ. Alopecia areata: review of epidemiology, clinical features, pathogenesis, and new treatment options. Int J Trichol 2018;10(2):51.

20. Gupta AK, Carviel JL, Foley KA, Shear NH, Piraccini BM, Piguet V, et al. Monotherapy for alopecia areata: a systematic review and network meta-analysis. Skin Appendage Disorders 2019; 5(6):331-7.
21. Messenger AG, McKillop J, Farrant P, McDonagh AJ, Sladden M, Hughes J, et al. British Association of Dermatologists' guidelines for the management of alopecia areata 2012. Br J Dermatol 2012; 166(5):916-26.
22. Das S, Ghorami RC, Chatterjee T, Banerjee G. Comparative assessment of topical steroids, topical tretenoin (0.05%) and dithranol paste in alopecia areata. Ind J Dermatol 2010;55(2):148.
23. Daunton A, Harries M. Efficacy of topical dithranol (Dithrocream®) in the treatment of alopecia areata: a retrospective case series. Br J Dermatol 2019;180(5):1246-7.
24. Ngwanya MR, Gray NA, Gumedze F, Ndyenga A, Khumalo NP. Higher concentrations of dithranol appear to induce hair growth even in severe alopecia areata. Dermatologic Therapy 2017; 30(4):e12500.
25. Sasmaz S, Arican O. Comparison of azelaic acid and anthralin for the therapy of patchy alopecia areata: a pilot study. Am J Clin Dermatol 2005;6:403-6.