



Efficacy of jak inhibitor in alopecia areata: A study in a tertiary care hospital in Bangladesh

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Abstract

Background: Alopecia areata (AA) is an autoimmune disorder characterized by non-scarring hair loss, often significantly impacting patients' psychological and social well-being. Current treatments have variable efficacy and limited reliability, creating a need for targeted therapies. Janus kinase (JAK) inhibitors have emerged as a promising option by modulating immune pathways involved in AA pathogenesis. This study aimed to evaluate the efficacy of JAK inhibitors in treating alopecia areata.

Methods: This comparative study was conducted at the Department of Dermatology and Venereology, Community Based Medical College Hospital, Bangladesh from July 2024 to December 2023. A total of 60 patients (aged 18–65 years) with >50% hair loss were randomly divided into two groups. Group A received a placebo, while Group B was treated with the JAK inhibitor deuruxolitinib (12 mg twice daily for 24 weeks). Follow-up data were collected at 8, 12, 16, 20, and 24 weeks and analyzed using SPSS version 23.0.

Results: In this study, Group B, which received the Jak inhibitor, showed a significant reduction in the mean SALT score, from 78.7±9.3 at baseline to 11.3±3.3 at 24 weeks (p<0.001). In contrast, Group A, which received the placebo, had no significant change in SALT scores (p=0.104). Furthermore, 56.7% of participants in Group B were satisfied with the treatment, compared to only 6.7% in Group A.

Conclusion: The study concludes that Jak inhibitor treatment significantly reduces alopecia severity in patients, as indicated by the SALT score. Participants receiving the treatment showed marked improvement and higher satisfaction compared to those receiving the placebo.

Keywords: Alopecia areata, AA, jak inhibitor, placebo, partial scalp hair loss, salt

Introduction

Alopecia areata (AA) is a common autoimmune disorder characterized by non-scarring hair loss that can range from small patches to complete scalp or body hair loss. The condition results from a T-cell-mediated attack on hair follicles, disrupting their normal function and leading to hair shedding. While its exact etiology remains unclear, genetic predisposition, environmental factors, and immune dysregulation are believed to contribute significantly [1, 2]. This multifactorial origin poses challenges in developing effective treatments that address the disease's underlying mechanisms. The treatment landscape for AA has historically included corticosteroids, topical immunotherapies, and other immunosuppressive agents, which often yield inconsistent results and are associated with significant side effects [3]. The emergence of Janus kinase (JAK) inhibitors has revolutionized the therapeutic approach to AA. These inhibitors target the JAK-STAT pathway, a critical signaling mechanism implicated in the pathogenesis of autoimmune diseases, including AA [4, 5]. By suppressing this pathway, JAK inhibitors have demonstrated promising efficacy in reducing inflammation and promoting hair regrowth in clinical trials [6]. Recent studies have highlighted the effectiveness of JAK inhibitors such as tofacitinib, ruxolitinib, and baricitinib in managing AA, with significant hair regrowth observed in a substantial proportion of patients [7, 9]. However, the efficacy of these treatments varies based on factors such as the extent of hair loss, disease duration, and patient comorbidities. Additionally, the potential adverse effects, including infections, hematological abnormalities, and hepatic

dysfunction, underscore the need for careful patient selection and monitoring during therapy [10, 11]. In Bangladesh, AA is a relatively under-researched condition, despite its psychosocial and economic burden. Limited local data are available regarding the prevalence and treatment outcomes of AA, particularly with newer therapeutic agents such as JAK inhibitors. This study aimed to evaluate the efficacy and safety of JAK inhibitors in managing AA in a tertiary care hospital in Bangladesh. By analyzing clinical outcomes and adverse events, the study seeks to provide evidence-based insights into the role of JAK inhibitors in the Bangladeshi population, contributing to the global understanding of their utility in AA management [12, 15].

Methodology

This was a comparative study that was conducted at the Department Dermatology and Venereology, Community Based Medical College Hospital, Bangladesh from July 2024 to December 2023. A total of 60 patients, aged 18 to 65 years, with over 50% hair loss were randomly assigned to two groups. Group A received a placebo, while Group B was administered the JAK inhibitor deuruxolitinib at a dose of 12 milligrams twice daily for 24 weeks. The primary endpoint was the proportion of patients achieving a Severity of Alopecia Tool (SALT) score, while a key secondary endpoint was the percentage of satisfaction among hair patient-reported outcome responders [16]. Trained raters assessed hair loss severity using the SALT during in-person visits conducted every four weeks, supplemented by photographic documentation of scalp changes. Data were analyzed using SPSS version 23.0.

Result

The baseline characteristics of participants in Groups A and B were comparable. The mean age was 38.5 ± 12.1 years in Group A and 37.4 ± 11.7 years in Group B. The proportion of males was 30.0% in Group A and 40.0% in Group B, with females comprising 70.0% and 60.0%, respectively. The mean SALT score was 87.4 ± 17.12 in Group A and 86.3 ± 21.32 in Group B. Regarding AA classification, partial hair loss was observed in 36.7% of Group A and 33.3% of Group B, while complete hair loss was seen in 63.3% and 66.7%, respectively. Nail involvement was present in 36.7% of Group A and 33.3% of Group B. Nasal hair involvement was noted in 60.0% of Group A and 56.7% of Group B. Eyebrow involvement was identical at 73.3% in both groups, while eyelash involvement was 63.3% in Group A and 70.0% in Group B. The mean Severity of Alopecia Tool (SALT) score remained relatively unchanged throughout the placebo treatment at the 4th, 12th, 16th, 20th, and 24th weeks. In contrast, Group 2 demonstrated a progressive reduction in mean SALT scores, decreasing from 79 in the 4th week to 11 by the 24th week. The outcomes based on the Severity of Alopecia Tool (SALT) score showed notable differences between the two groups. In Group A, the mean SALT score decreased from 79.3 ± 9.2 at baseline to 71.4 ± 8.1 at 24 weeks, which was not statistically significant ($p=0.104$). Conversely, Group B experienced a significant reduction in the mean SALT score, from 78.7 ± 9.3 at baseline to 11.3 ± 3.3 at 24 weeks ($p<0.001$), indicating a marked improvement in alopecia severity in this group. In Group A, only 6.7% of participants were satisfied with the treatment, compared to 56.7% in Group B.

Table 1: Baseline characteristics of participants

Characteristics	Group-A (n=30)		Group-B (n=30)	
	n	%	n	%
	Demographic characteristic			
Mean age	38.5 ± 12.1		37.4 ± 11.7	
Male	9	30.0%	12	40.0%
Female	21	70.0%	18	60.0%
Clinical characteristic				
SALT score (Mean)	87.4 ± 17.12		86.3 ± 21.32	
AA classification				
Partial hair loss	11	36.7%	10	33.3%
Complete hair loss	19	63.3%	20	66.7%
Nail, nasal hair, eyebrow & eyelash involvement				
Nail	11	36.7%	10	33.3%
Nasal hair	18	60.0%	17	56.7%
Eyebrow	22	73.3%	22	73.3%
Eyelash	19	63.3%	21	70.0%

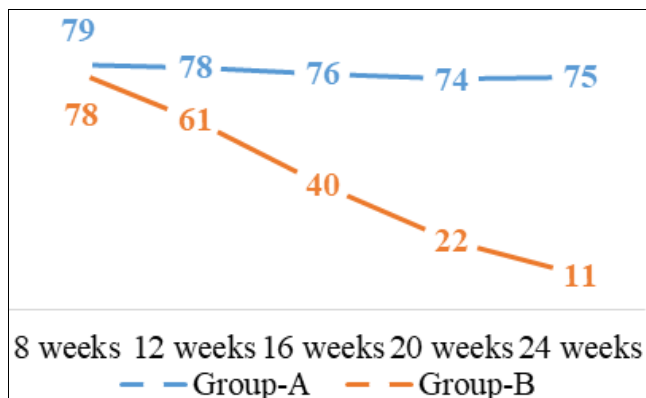


Fig 1: Periodic SALT score distribution

Table 2: Outcomes as per Severity of Alopecia Tool (SALT) score

Group	Baseline	24 weeks	p-value
	Mean \pm SD		
Group-A	79.3 ± 9.2	71.4 ± 8.1	0.104
Group-B	78.7 ± 9.3	11.3 ± 3.3	<0.001

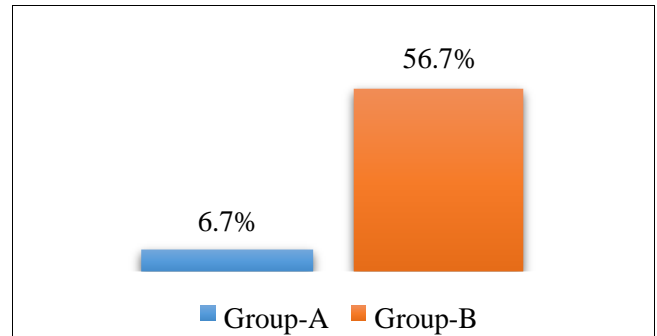


Fig 2: Participants satisfaction at week 24

Discussion

In this study, the baseline characteristics of participants in Groups A and B were comparable, with similar mean ages (38.5 ± 12.1 years in Group A and 37.4 ± 11.7 years in Group B). The gender distribution was slightly different, with 30.0% males and 70.0% females in Group A, and 40.0% males and 60.0% females in Group B. The mean Severity of Alopecia Tool (SALT) score at baseline was also similar, being 87.4 ± 17.12 in Group A and 86.3 ± 21.32 in Group B. Regarding Alopecia Areata (AA) classification, partial hair loss was observed in 36.7% of Group A and 33.3% of Group B, while complete hair loss was seen in 63.3% and 66.7%, respectively. Nail involvement was reported in 36.7% of Group A and 33.3% of Group B. Nasal hair involvement was observed in 60.0% of Group A and 56.7% of Group B. Eyebrow involvement was noted in 73.3% of both groups, while eyelash involvement was 63.3% in Group A and 70.0% in Group B. The SALT score remained relatively unchanged in Group A throughout the placebo treatment period, with no significant difference in scores at the 4th, 12th, 16th, 20th, and 24th weeks. This finding is consistent with some studies reporting limited change in SALT scores with placebo treatments [17]. On the other hand, Group B showed a progressive reduction in mean SALT scores from 79 in the 4th week to 11 by the 24th week, suggesting significant improvement. This pattern of improvement aligns with the results of other studies that report similar effects in the reduction of SALT scores following active treatment [18]. At the 24-week follow-up, Group A's mean SALT score decreased from 79.3 ± 9.2 at baseline to 71.4 ± 8.1 , but this change was not statistically significant ($p=0.104$), which is consistent with studies that demonstrate limited effects of certain treatments in improving alopecia severity [19]. In contrast, Group B experienced a significant reduction in the mean SALT score, from 78.7 ± 9.3 at baseline to 11.3 ± 3.3 at 24 weeks ($p<0.001$), indicating a marked improvement. These results are comparable to those observed in other studies that highlight the efficacy of similar treatments for alopecia areata [20]. Satisfaction rates also showed a clear distinction between the groups. In Group A, only 6.7% of participants expressed satisfaction with the treatment, whereas in Group B, 56.7% reported being satisfied. This difference in satisfaction is consistent with findings from studies that

highlight a significant correlation between treatment efficacy and patient satisfaction in the management of alopecia areata^[21]. The overall findings of this study support the notion that the treatment used in Group B significantly improves the severity of alopecia areata, as reflected in both the SALT scores and patient satisfaction. This is in agreement with existing literature, which reports favorable outcomes with active treatments, while placebo treatments show limited effects on disease severity^[22].

Conclusion & Recommendation

The study concluded that the Jak inhibitor treatment was effective in significantly improving alopecia severity in patients with Alopecia Areata. Participants who received the Jak inhibitor showed a marked reduction in the Severity of Alopecia Tool (SALT) score, while those who received the placebo showed no significant change. Additionally, a higher level of satisfaction was reported by those in the Jak inhibitor group compared to the placebo group, highlighting the positive impact of the treatment.

References

1. Persechino F, *et al.* "Skin manifestations and coeliac disease in the pediatric population." *Nutrients*,2021;13(10):3611.
2. King B, *et al.* "Overview of alopecia areata for managed care and payer stakeholders in the United States." *Journal of Managed Care & Specialty Pharmacy*,2023;29(7):848-856.
3. Liu M, *et al.* "Janus Kinase Inhibitors for Alopecia Areata: A Systematic Review and Meta-Analysis of Randomized Clinical Trials." Available at SSRN 4294799.
4. Mackay-Wiggan J, *et al.* "Oral ruxolitinib induces hair regrowth in patients with moderate-to-severe alopecia areata." *JCI insight*, 2016, 1(15).
5. Dai Z, *et al.* "Selective inhibition of JAK3 signaling is sufficient to reverse alopecia areata." *JCI insight*, 2021, 6(7).
6. King B, *et al.* "Two phase 3 trials of baricitinib for alopecia areata." *New England Journal of Medicine*,2022;386(18):1687-1699.
7. Phan K, Sebaratnam DF. "JAK inhibitors for alopecia areata: a systematic review and meta-analysis." *Journal of the European Academy of Dermatology and Venereology*,2019;33(5):850-856.
8. Dillon KL. "A comprehensive literature review of JAK inhibitors in the treatment of alopecia areata." *Clinical, Cosmetic and Investigational Dermatology*, 2021, 691-714.
9. Newsom M, *et al.* "New and emerging systemic treatments for atopic dermatitis." *Drugs*,2020;80:1041-1052.
10. Faria S, Freitas E, Torres T. "Efficacy and safety of baricitinib in patients with alopecia areata: Evidence to date." *Drugs in Context*, 2023, 12.
11. AlMutairi N, Nour T. "Tofacitinib in pediatric psoriasis: an open-label trial to study its safety and efficacy in children." *Dermatology*,2020;236(3):191-198.
12. Rahman MM, *et al.* "An insight into COVID-19 and traditional herbs: bangladesh perspective." *Medicinal Chemistry*,2023;19(4):361-383.
13. Hasan M, *et al.* "Prevalence and associated risk factors for mental health problems among patients with polycystic ovary syndrome in Bangladesh: A nationwide cross—Sectional study." *PloS one*,2022;17(6):e0270102.
14. Juncan AM, *et al.* "Advantages of hyaluronic acid and its combination with other bioactive ingredients in cosmeceuticals." *Molecules*,2021;26(15):4429.
15. Ahmed SR, *et al.* "Therapeutic promises of medicinal plants in Bangladesh and their bioactive compounds against ulcers and inflammatory diseases." *Plants*,2021;10(7):1348.
16. King B, *et al.* "Efficacy and safety of deuruxolitinib, an oral selective Janus kinase inhibitor, in adults with alopecia areata: Results from the Phase 3 randomized, controlled trial (THRIVE-AA1)." *Journal of the American Academy of Dermatology*,2024;91(5):880-888.
17. Lagacé F, *et al.* "The role of sex and gender in dermatology—from pathogenesis to clinical implications." *Journal of Cutaneous Medicine and Surgery*,2023;27(4):NP1-NP36.
18. McCarthy A. "A qualitative exploration of Alopecia: impact, coping and interactions with professionals.", 2024.
19. Lee S, *et al.* "Topographic phenotypes of alopecia areata and development of a prognostic prediction model and grading system: a cluster analysis." *JAMA dermatology*,2019;155(5):564-571.
20. Malik S, Matushansky JT, Thomas C, Lipner SR. *Hair & Nails. cutis*, 108, 2.
21. Sondermann W, *et al.* "Effects of patients' expectation in dermatology: evidence from experimental and clinical placebo studies and implications for dermatologic practice and research." *Dermatology*,2021;237(6):857-871.'
22. Gleave A, Granville DJ. "Granzyme B in autoimmune skin disease." *Biomolecules*,2023;13(2):388.