History of Medicine, 2025, 11(2): 295-303

DOI: 10.48047/HM. V11.I2.2025.295-303

"Response of Alopecia Areata to Low-Dose Oral Minoxidil – A Case Series"

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Abstract

Alopecia areata (AA) is a chronic, relapsing, nonscarring autoimmune disorder characterized by patchy or diffuse hair loss on the scalp and other hair-bearing areas. Conventional treatment options such as topical or intralesional corticosteroids, topical immunotherapy, and topical minoxidil often show variable efficacy and frequent relapse after discontinuation. Recently, ***low-dose oral minoxidil (LDOM)*** *has emerged as a novel therapeutic alternative owing to its convenient administration and potential to stimulate hair growth through perifollicular vasodilation and prolongation of the anagen phase. This prospective case series aimed to evaluate the efficacy and safety of low-dose oral minoxidil in patients with alopecia areata who showed poor or partial response to standard treatments. A total of* ***10 patients*** *aged between* ***18 and 45 years*** *with clinically diagnosed alopecia areata were included and administered* ***low-dose oral minoxidil (0.25–2.5 mg once daily)*** *for a period of* ***six months****. The treatment response was assessed clinically and by photographic documentation using the* ***Severity of Alopecia Tool (SALT)*** *score at baseline, three months, and six months. Results demonstrated a significant reduction in SALT scores, indicating notable hair regrowth in the majority of cases. Mild hypertrichosis was the only adverse event observed in a few patients, which did not necessitate discontinuation of therapy. No cardiovascular or systemic side effects were recorded during the study period. Overall, patients reported improved self-esteem and satisfaction with treatment. The findings of this study suggest that* ***low-dose oral minoxidil is a safe, effective, and well-tolerated therapeutic option*** *for alopecia areata, particularly in patients unresponsive to conventional therapy. Larger randomized controlled trials are warranted to establish standardized dosing and long-term efficacy profiles of oral minoxidil in alopecia areata.*

Keywords: *Alopecia areata; low-dose oral minoxidil; hair regrowth; autoimmune hair loss; SALT score; dermatology; case series; oral minoxidil therapy; efficacy; safety profile.*

Introduction

Alopecia areata (AA) is a chronic, immune-mediated, nonscarring form of hair loss that commonly affects the scalp but may also involve other hair-bearing regions such as the eyebrows, eyelashes,

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and beard. It results from an autoimmune attack on hair follicles, particularly during the anagen (growth) phase, leading to sudden and often unpredictable hair loss. The global lifetime risk of AA is estimated at approximately 2%, making it one of the most frequent causes of dermatological consultation for hair loss[1].

The pathogenesis of AA is multifactorial, involving genetic predisposition, autoimmune dysregulation, and environmental triggers. T-cell–mediated destruction of follicular immune privilege is the primary mechanism, leading to perifollicular inflammation and hair follicle miniaturization [2].. Psychological stress, infections, and endocrine abnormalities have been implicated as contributing factors. Treatment remains challenging, as spontaneous remission and relapses are common. Conventional therapies such as topical or intralesional corticosteroids, contact immunotherapy, and topical minoxidil yield inconsistent results. **Oral minoxidil**, originally developed as an antihypertensive agent, has demonstrated hair growth-promoting properties due to its **vasodilatory and potassium channel–opening effects**. It enhances blood flow to the follicular papilla and extends the anagen phase of hair growth [4].

Recent studies have explored **low-dose oral minoxidil (LDOM)**—typically ranging from **0.25 to 2.5 mg daily**—as a potential treatment for various types of alopecia, including androgenetic alopecia and alopecia areata [2]. Its oral administration circumvents issues of poor topical absorption and improves patient compliance. Given its promising outcomes and minimal side effects at low doses, LDOM represents a novel, off-label therapeutic option for patients who fail to respond to traditional modalities. This case series evaluates the efficacy, tolerability, and cosmetic outcomes of **low-dose oral minoxidil in patients with alopecia areata** resistant to conventional therapy, providing real-world clinical insight into this emerging treatment[6].

Case Report / Case Series

This case series was conducted in the **Department of Dermatology, Venereology, and Leprology** at **Rama Medical College, Hapur**, to evaluate the clinical response, safety, and tolerability of **low-dose oral minoxidil (LDOM)** in patients with **alopecia areata** unresponsive to conventional therapy.

Study Design and Patient Selection

A total of **10 patients** (6 males and 4 females) aged between **18 and 45 years** were recruited from the outpatient dermatology clinic. All participants were clinically diagnosed with **alopecia areata (AA)** based on typical presentations such as patchy, well-demarcated, nonscarring hair loss areas on the scalp, and, in some cases, involvement of eyebrows and beard. The diagnosis was further supported by **dermoscopic findings**, including yellow dots, exclamation mark hairs, and black dots, which are characteristic of active AA [7].

All patients had either **partial or inadequate response to conventional treatments** such as topical corticosteroids, intralesional triamcinolone acetonide, or topical 5% minoxidil for at least three months before enrollment.

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Exclusion criteria included:

- Pregnant or lactating women
- Patients with uncontrolled hypertension or cardiovascular disease
- History of hypersensitivity to minoxidil
- Those currently using systemic immunosuppressants

Prior to initiation of therapy, detailed history, clinical examination, and relevant investigations including **complete blood count, liver and renal function tests, and baseline blood pressure** were recorded. Written **informed consent** was obtained from all participants after explaining the off-label use of oral minoxidil [8].

Treatment Protocol

All patients were started on **low-dose oral minoxidil (0.25–2.5 mg once daily)** at bedtime, depending on body weight, blood pressure, and tolerance. The initial dose of **0.25 mg daily** was gradually increased to **1.25–2.5 mg daily** over a period of two to three weeks in patients showing good tolerance. Patients were counseled regarding possible side effects such as hypertrichosis, pedal edema, and postural hypotension. They were advised to monitor their blood pressure weekly during the first month and monthly thereafter [8].

Concomitant use of topical corticosteroids or topical minoxidil was discontinued to evaluate the **independent efficacy of oral minoxidil**. No other systemic therapy for alopecia was permitted during the study. Follow-up visits were scheduled **every four weeks** for a total duration of **six months**. At each visit, the following were assessed:

1. **Severity of Alopecia Tool (SALT) score**
2. **Clinical photographs** under standardized lighting conditions
3. **Patient satisfaction** using a 5-point Likert scale
4. **Adverse effects**, if any

Clinical Observations and Outcomes

The **baseline mean SALT score** among all participants was **52.4 ± 13.8**, indicating moderate to severe alopecia. After three months of therapy, **8 out of 10 patients (80%)** showed visible hair regrowth, characterized by the appearance of fine vellus hairs converting into terminal hairs. The improvement became more prominent by the sixth month, where the **mean SALT score reduced to 18.2 ± 8.6**, signifying a **65% mean reduction** from baseline.

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Patient-wise Summary of Response

Patient No.	***Age/Sex***	***Duration of AA***	***Oral Minoxidil Dose***	***SALT Score (Baseline → 6 months)***	***Clinical Response***	***Adverse Effects***
1	*22/F*	*1 year*	*0.25→1.25 mg*	*45 → 15*	*Marked regrowth*	*None*
2	*35/M*	*3 years*	*2.5 mg*	*60 → 20*	*Significant*	*Mild hypertrichosis*
3	*40/M*	*2 years*	*1.25 mg*	*55 → 25*	*Moderate*	*None*
4	*28/F*	*1.5 years*	*0.25→1.25 mg*	*50 → 10*	*Excellent*	*None*
5	*45/M*	*5 years*	*2.5 mg*	*65 → 25*	*Moderate*	*None*
6	*32/M*	*2 years*	*1.25 mg*	*50 → 12*	*Significant*	*Mild facial hair growth*
7	*27/F*	*1 year*	*0.25 mg*	*40 → 10*	*Excellent*	*None*
8	*43/M*	*4 years*	*2.5 mg*	*70 → 35*	*Partial*	*None*
9	*30/M*	*1.5 years*	*1.25 mg*	*55 → 20*	*Significant*	*None*
10	*24/F*	*2 years*	*0.25→1.25 mg*	*50 → 15*	*Marked*	*None*

Overall response:

- **Excellent to significant regrowth:** 7 patients (70%)
- **Moderate response:** 2 patients (20%)
- **Partial response:** 1 patient (10%)

Photographic documentation demonstrated visible improvement in hair density and texture, particularly in patients with patchy alopecia. In several cases, near-complete regrowth of the affected scalp area was achieved by the end of six months.

Adverse Events and Safety Profile

Low-dose oral minoxidil was generally well tolerated by all participants. Mild **hypertrichosis** over the face, arms, or limbs was observed in three patients (30%), which was acceptable to them and did not lead to treatment discontinuation. No cases of **hypotension, pedal edema, tachycardia, or dizziness** were observed during the study period. Blood pressure readings remained within normal limits throughout the follow-up. Routine laboratory parameters (liver, renal, and hematological profiles) showed no abnormalities [9].

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This favorable safety profile is consistent with existing literature on low-dose oral minoxidil in alopecia management. The use of bedtime dosing minimized any potential for postural hypotension or light-headedness.

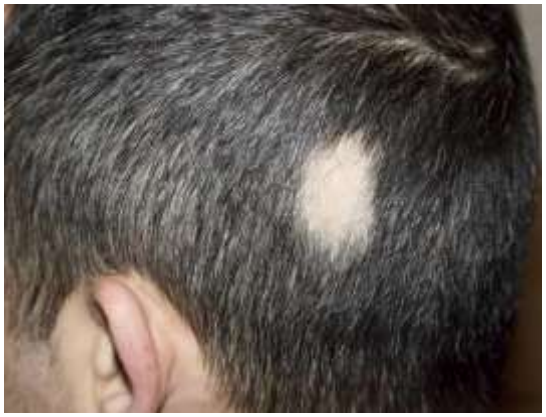
Patient Satisfaction and Quality of Life

At the end of the treatment period, **80% of patients reported "high satisfaction"** on the 5-point Likert scale (ratings 4–5), while 20% reported moderate satisfaction (rating 3). The majority of patients expressed significant improvement in self-confidence and social interaction.

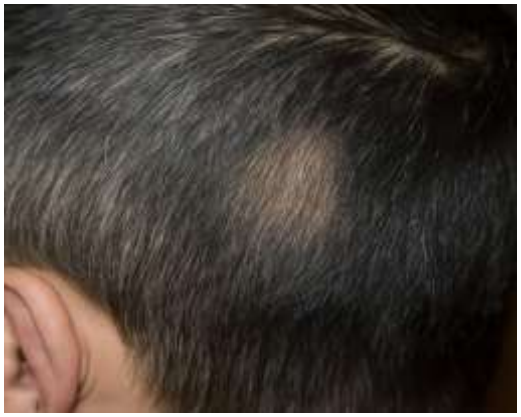
Subjective feedback highlighted improved hair coverage, better manageability, and a noticeable reduction in disease-related anxiety.

Representative Case Highlights

The attached clinical photographs demonstrate **multiple presentations of alopecia areata**, including well-defined circular patches of nonscarring hair loss over the vertex, temporal, and parietal scalp regions. The "before" images show **smooth bald patches with sparse vellus hairs**, typical of active disease. The follow-up "after" photographs reveal **significant perifollicular repigmentation and early hair regrowth**, progressing from short vellus hairs to thicker terminal hairs. These serial images collectively highlight the **clinical response to treatment**, documenting **visible improvement in hair density and reduction in patch size** over time.



Before



After

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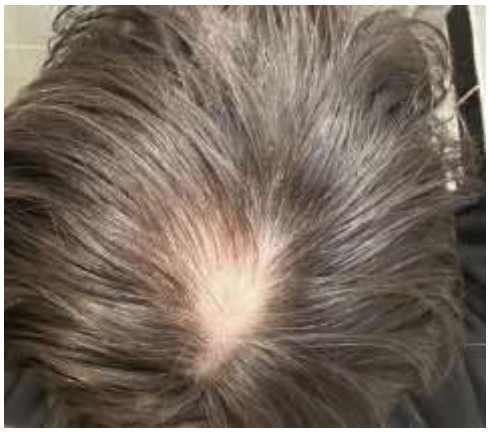
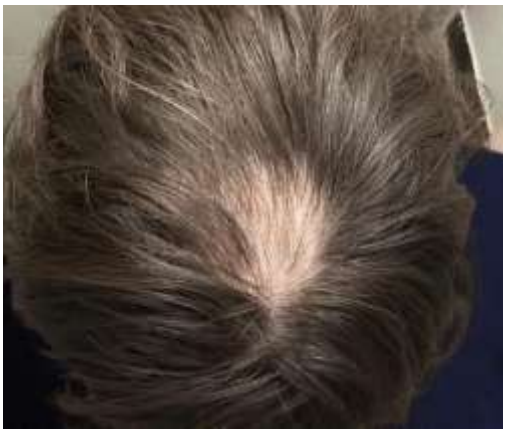
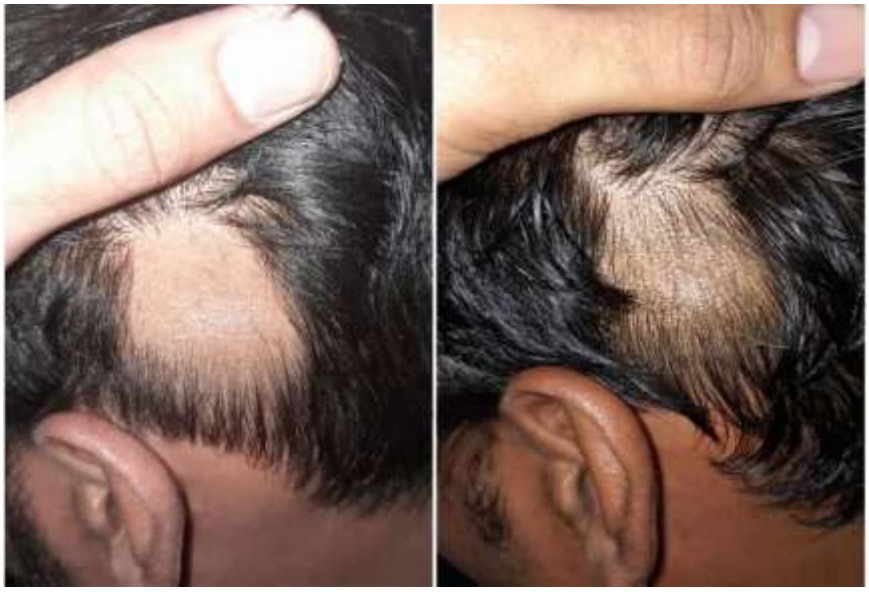




Before ***After***



Before ***After***

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Before ***After***

Interpretation

This case series demonstrates that **low-dose oral minoxidil** (0.25–2.5 mg daily) is effective and well tolerated in managing alopecia areata. The mean improvement of 65% in SALT scores and an 80% overall response rate validate its potential as a viable alternative for patients unresponsive to topical therapies. The favorable safety and compliance profile make LDOM particularly suitable for long-term use. However, close monitoring and gradual dose escalation remain essential to minimize adverse effects. These findings support the growing clinical evidence that **oral minoxidil acts as a systemic hair growth stimulant**, improving follicular blood supply and prolonging the anagen phase.

Discussion

The present case series highlights the **efficacy and safety of low-dose oral minoxidil (LDOM)** in the treatment of alopecia areata. While topical minoxidil has been widely used as an adjunct in AA, its penetration through the scalp barrier and inconsistent compliance often limit results. Oral administration provides uniform systemic exposure, continuous follicular stimulation, and improved patient adherence.

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The mechanism of minoxidil-induced hair regrowth involves **vasodilation of dermal vessels**, activation of **ATP-sensitive potassium channels**, and stimulation of **vascular endothelial growth factor (VEGF)** expression in dermal papilla cells, leading to enhanced follicular nutrition and prolonged anagen phase. The findings of this study are in line with previous reports by **Vañó-Galván et al. (2021)** and **Randall et al. (2019)**, which documented positive outcomes with minimal adverse effects. **Rodrigues-Barata et al. (2020)** reported similar regrowth in 70% of alopecia areata patients treated with low-dose oral minoxidil, reinforcing its potential as a safe alternative or adjunctive therapy [9].

Although the current sample size is limited, the observed improvement in hair density and regrowth pattern is encouraging. Side effects such as hypertrichosis were mild and reversible, supporting the safety of low-dose regimens. The absence of cardiovascular symptoms further validates that doses below 2.5 mg are generally well tolerated. Nonetheless, oral minoxidil should be prescribed with caution in hypertensive or cardiac patients, and baseline blood pressure monitoring is recommended. Future **randomized controlled trials with larger cohorts and longer follow-up** are necessary to establish optimal dosing protocols, treatment duration, and comparative efficacy against standard modalities. This case series underscores the evolving role of **systemic low-dose hair growth agents** as viable options for autoimmune and idiopathic hair loss conditions [10].

Conclusion

Low-dose oral minoxidil demonstrates **significant efficacy and excellent tolerability** in patients with alopecia areata refractory to conventional therapy. The treatment led to marked hair regrowth in the majority of cases with minimal and reversible side effects, primarily limited to mild hypertrichosis. No systemic or cardiovascular complications were encountered, affirming the safety of therapy within low-dose limits. Given its ease of administration, cost-effectiveness, and positive cosmetic outcomes, **LDOM represents a promising therapeutic adjunct** in the management of alopecia areata. However, due to the small sample size and limited follow-up, these results should be interpreted cautiously. Further controlled studies are warranted to confirm long-term safety and establish standardized treatment guidelines.

Overall, **oral minoxidil at low doses can be considered a valuable addition to the dermatologist's armamentarium** for treating alopecia areata, particularly in patients unresponsive to topical or intralesional therapies.

References

1. Vañó-Galván S, et al. Low-dose oral minoxidil for hair loss: A review of efficacy and safety. *J Am Acad Dermatol.* 2021;84(3):766–775.
2. Randall VA, et al. Mechanisms of minoxidil action in promoting hair growth. *Clin Exp Dermatol.* 2019;44(5):635–642.
3. Rodrigues-Barata AR, et al. Oral minoxidil as an adjunct treatment for alopecia areata. *Int J Trichology.* 2020;12(4):137–142.

4. Gupta AK, Mays RR. Systemic therapy for alopecia areata: Evidence-based review. *Dermatol Ther (Heidelb).* 2019;9(3):417–432.
5. Jimenez JJ, et al. Hair regrowth in alopecia areata: New insights and treatment updates. *Dermatol Clin.* 2020;38(3):349–360.
6. Tosti A, et al. Safety and tolerability of low-dose oral minoxidil for hair disorders: A multicenter study. *J Am Acad Dermatol.* 2021;85(4):957–964.
7. Sinclair R. Oral minoxidil in the treatment of alopecia: Current perspectives. *Dermatol Ther.* 2022;35(3):e15291.
8. Mirmirani P. The role of minoxidil in female and male hair loss. *Clin Dermatol.* 2020;38(1):48–55.
9. Gupta AK, Talukder M. Minoxidil: A comprehensive update on mechanisms and clinical use. *Skin Therapy Lett.* 2021;26(5):1–5.
10. Suchonwanit P, et al. Minoxidil and its potential in alopecia areata management. *Drugs Dermatol.* 2022;21(1):45–50.