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Clinical efficacy of intramuscular corticosteroids in the management of alopecia areata: a prospective observational study

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Abstract
Background: Alopecia areata (AA) is a chronic autoimmune disorder characterized by patchy, non-scarring hair loss resulting from collapse of follicular immune privilege. CD8+ NKG2D+ T lymphocytes, dendritic cells, interferon-γ (IFN-γ), and interleukin-15 (IL-15) play central roles in disease pathogenesis through activation of the JAK–STAT pathway. While intralesional corticosteroids are commonly used for localized disease, extensive or rapidly progressive AA often requires systemic therapy. Intramuscular corticosteroids (IMC) provide controlled systemic drug delivery with fewer pharmacokinetic fluctuations compared to oral corticosteroids.
Objectives: To evaluate the clinical efficacy of monthly intramuscular corticosteroids in alopecia areata, quantify hair regrowth using SALT score reduction, assess relapse and adverse effects during a six-month follow-up, and compare outcomes with published literature.
Methods: A prospective observational study was conducted on 44 patients with alopecia areata (patchy, totalis, and universalis types) aged 18–60 years. Patients received monthly intramuscular corticosteroid injections for three months. Clinical evaluation was performed using SALT scoring and standardized photography at baseline, 1 month, 3 months, and 6 months. The primary outcome was ≥50% reduction in SALT score at 3 months.
Results: The mean age of participants was 31.6 ± 9.4 years with a male-to-female ratio of 1.3:1. Overall, 65.9% of patients achieved more than 50% reduction in SALT score at three months. Patchy alopecia areata showed the best response, while alopecia totalis and universalis demonstrated partial regrowth. Mean SALT score reduction was 58.2%. Sustained regrowth at six months was observed in 79.6% of patients, with relapse in 20.4%. Adverse effects were mild and transient.
Conclusion: Monthly intramuscular corticosteroids are an effective, well-tolerated, and practical therapeutic option for extensive alopecia areata, with outcomes comparable to published literature.

Keywords: Alopecia areata, intramuscular corticosteroids, SALT score, Systemic therapy, autoimmune hair loss

Introduction

Alopecia areata (AA) is a chronic autoimmune disease characterized by patchy, non-scarring hair loss involving the scalp and other hair-bearing areas. The disease is associated with significant psychological morbidity due to its unpredictable course and cosmetic impact. The immunopathogenesis of AA involves a breakdown of the immune privilege of the hair follicle, leading to T-cell-mediated destruction of anagen hair follicles. CD8+ NKG2D+ cytotoxic T cells, dendritic cells, and pro-inflammatory cytokines such as IFN-γ and IL-15 are key mediators in this process, with downstream activation of the JAK–STAT pathway perpetuating follicular inflammation.

Intralesional corticosteroids are widely used in localized alopecia areata and remain a first-line therapy. However, their use is limited in patients with extensive scalp involvement, alopecia totalis, or alopecia universalis due to pain, impracticality, and limited coverage. Oral systemic corticosteroids are effective but are associated with fluctuating serum levels, higher cumulative doses, potential rebound flares, and systemic adverse effects.

Intramuscular corticosteroids offer a middle path between localized and systemic therapy by providing sustained systemic exposure with fewer peaks and troughs. This route is simple, cost-effective, and feasible in outpatient settings. Previous reports have documented regrowth rates of 75–80% with intramuscular corticosteroid therapy, although relapse remains common. The present study was undertaken to evaluate the efficacy and safety of monthly intramuscular corticosteroids in alopecia areata and to compare outcomes with existing literature.

Aims and Objectives

1. To evaluate the clinical efficacy of monthly intramuscular corticosteroids in alopecia areata.
2. To quantify hair regrowth using SALT score reduction.
3. To assess relapse rates and adverse effects during a six-month follow-up.
4. To compare outcomes with international literature.
5. To assess the feasibility of intramuscular therapy as an alternative to intralesional corticosteroids.
6. To recommend further controlled trials for validation.

Materials and Methods

This prospective observational study included 44 patients diagnosed with alopecia areata attending the dermatology outpatient department. Patients aged 18–60 years with patchy alopecia areata, alopecia totalis, and alopecia universalis were included. Pregnant women and patients with endocrine disorders or systemic autoimmune diseases were excluded. Ethical clearance was obtained, and informed consent was taken from all participants. The study was conducted in accordance with Good Clinical Practice guidelines.

All patients received monthly intramuscular corticosteroid injections for a period of three months. No concurrent

topical or systemic therapies were permitted during the study period. Clinical assessment was carried out using the Severity of Alopecia Tool (SALT) score, along with standardized clinical photography under identical lighting and distance at baseline, one month, three months, and six months. SALT scoring was performed by the same observer at all visits.

The primary outcome measure was a reduction of at least 50% in SALT score at three months. Secondary outcomes included occurrence of adverse effects, relapse during follow-up, and patient satisfaction. All adverse events were documented and managed conservatively. Data were analyzed using descriptive statistics and expressed as mean ± standard deviation and proportions.

Results

The mean age of the study population was 31.6 ± 9.4 years, with a male-to-female ratio of 1.3:1. Patchy alopecia areata constituted 61.4% of cases, alopecia totalis 25%, and alopecia universalis 13.6%. The majority of patients had disease duration of less than one year. Baseline SALT scores ranged from 20% to 90%, and none had received prior systemic therapy.

At the end of three months of treatment, 29 out of 44 patients (65.9%) achieved more than 50% reduction in SALT score. Patchy alopecia areata showed the most favorable response, while alopecia totalis and universalis demonstrated partial but clinically meaningful regrowth. The mean SALT score reduction was 58.2%. Visible regrowth was observed as early as six to eight weeks after initiation of therapy.

Continuous improvement in SALT scores was noted across all assessment time points. At six months of follow-up, sustained improvement was maintained in 79.6% of patients. Relapse was observed in nine patients (20.4%) within three months after discontinuation of therapy. Relapse was generally mild and responded to repeat monthly intramuscular injections. Treatment was well tolerated, compliance was high, and adverse effects were mild and self-limiting, with no serious events reported.

Discussion

Intramuscular corticosteroids provide uniform systemic distribution with a lower cumulative steroid exposure compared to oral regimens, thereby minimizing adverse effects. The relapse rate observed in this study (20.4%) is lower than that reported in many oral corticosteroid series. The therapeutic benefit is mediated through suppression of inflammatory cytokines such as IL-1, TNF-α, and IFN-γ, leading to restoration of follicular immune privilege. Monthly dosing may help prevent rebound inflammatory activity and improve adherence due to ease of administration.

The clinical response in the present study is consistent with international literature reporting regrowth rates of 70–80% with intramuscular corticosteroid therapy. This modality serves as an effective bridge between intralesional and oral systemic therapies, especially in patients with extensive disease or lesions that are difficult to inject. The favorable safety profile, cost-effectiveness, and practicality in outpatient settings enhance its clinical utility.

Limitations of the study include a relatively small sample size, absence of a control group, and limited follow-up duration. Despite these limitations, the consistent improvement observed supports the therapeutic role of intramuscular corticosteroids in alopecia areata. Larger multicentric randomized controlled trials are recommended to validate these findings and determine optimal dosing protocols.

Conclusion

Monthly intramuscular corticosteroid therapy is an effective and well-tolerated treatment option for both patchy and extensive alopecia areata. It achieves significant hair regrowth with minimal adverse effects and represents a convenient, non-invasive, and economical systemic therapeutic modality. Further long-term controlled studies are required to establish standardized treatment regimens and durability of response.

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