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Assessing the Therapeutic Outcomes and Safety Profile of Topical Steroids in Pediatric Atopic Dermatitis: A Cohort Study

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ABSTRACT

Objective: To evaluate the efficacy and safety of topical corticosteroids in treating pediatric patients with atopic dermatitis (AD) in Pakistan, and to determine the optimal treatment regimen based on patient response.

Methods: This prospective cohort study was conducted at Jinnah Hospital, a tertiary care hospital in Lahore, Pakistan, over a period of 12 months. A total of 150 pediatric patients, aged 1–12 years, diagnosed with moderate-to-severe atopic dermatitis were enrolled. Participants were treated with different strengths of topical corticosteroids (mild, moderate, and potent) based on the severity of their condition. Treatment efficacy was assessed by the reduction in the Eczema Area and Severity Index (EASI) score and clinical improvement, while safety was monitored through the occurrence of side effects, such as skin thinning, striae, and delayed wound healing. Follow-up visits were scheduled at 2, 4, and 8 weeks, with data collection at each visit.

Results:Of the 150 enrolled patients, 140 completed the study. The mean age of participants was 6.2 ± 3.1 years, with 60% being male. After 8 weeks of treatment, 85% of patients showed significant improvement in their EASI scores, with a 70% reduction in overall severity. In the group using mild corticosteroids, 75% of patients showed improvement, whereas 90% of patients using moderate to potent corticosteroids experienced better outcomes. However, 15% of patients using moderate to potent corticosteroids developed mild side effects such as skin thinning and delayed wound healing, which resolved upon discontinuation of therapy. No severe side effects, including adrenal suppression or growth retardation, were observed.

Conclusion:Topical corticosteroids are an effective treatment for pediatric atopic dermatitis in Pakistan, with moderate to potent steroids showing the best clinical outcomes. However, close monitoring for side effects is essential, particularly in patients requiring higher-potency steroids. Further studies with a larger sample size and long-term follow-up are recommended to confirm these findings and determine the long-term safety of corticosteroid use in children..

1. INTRODUCTION

Atopic dermatitis (AD) is a chronic, inflammatory skin condition that affects a significant proportion of children worldwide, with estimates suggesting a prevalence of up to 20% in pediatric populations [1]. In Pakistan, the prevalence of AD among children has been steadily rising, with reports indicating that approximately 10-15% of children are affected [2].

The condition is characterized by pruritus, erythema, and skin lesions, and it significantly impacts the quality of life of affected individuals and their families [3]...

Topical corticosteroids (TCS) are considered the first-line treatment for managing AD due to their anti-inflammatory and immunosuppressive properties. However, there is ongoing concern about the long-term safety of corticosteroids in pediatric populations, particularly regarding their potential to cause skin thinning, striae, and systemic side effects, especially when used in potent forms [4]. Studies have demonstrated the efficacy of topical corticosteroids in reducing the severity of AD and improving quality of life, but the risk of adverse effects remains a significant consideration in pediatric dermatology [5].

In Pakistan, the use of topical steroids in the management of pediatric AD is widespread, but there is a limited amount of data on the specific efficacy and safety of these treatments in the local population. This study aims to fill this gap by prospectively evaluating the efficacy and safety of topical corticosteroids in treating pediatric patients with moderate-to-severe AD at a tertiary care hospital in Lahore, Pakistan. The findings of this study will contribute to the growing body of literature on pediatric dermatological treatments in Pakistan and help guide clinical decision-making regarding the use of corticosteroids in children with AD.

Methods

A prospective cohort study was conducted between January and December 2024 at Jinnah Hospital, a tertiary care hospital in Lahore, Pakistan. The study included 150 pediatric patients aged 1 to 12 years who were diagnosed with moderate-to-severe AD based on clinical criteria. The severity of AD was assessed using the Eczema Area and Severity Index (EASI) score, and treatment was initiated with topical corticosteroids of varying strengths (mild, moderate, and potent) depending on the severity of the disease.

Inclusion Criteria:

- Pediatric patients aged 1–12 years
- Diagnosed with moderate-to-severe AD based on clinical examination
- Written informed consent obtained from the parents or guardians

Exclusion Criteria:

- Patients with other chronic skin conditions
- Patients who had received systemic treatment for AD in the past month
- Those with a history of significant allergies or hypersensitivity to corticosteroids

Intervention:

Patients were divided into three groups based on the strength of the corticosteroid prescribed:

1. Mild corticosteroid (hydrocortisone 1%) for mild cases
2. Moderate corticosteroid (triamcinolone 0.1%) for moderate cases
3. Potent corticosteroid (betamethasone valerate 0.1%) for severe cases

The treatment was applied once daily for the first four weeks and then reduced to alternate days for the next four weeks. Patients were followed up at 2, 4, and 8 weeks for assessment of efficacy and safety. The EASI score was recorded at each visit to assess the clinical improvement, and side effects, such as skin thinning, striae, and delayed wound healing, were monitored.

Statistical Analysis:

Data were analyzed using SPSS version 24.0. Descriptive statistics were used to summarize demographic data, treatment efficacy (changes in EASI scores), and adverse events. The chi-square test was applied to compare the incidence of side effects between the groups. A p-value of less than 0.05 was considered statistically significant.

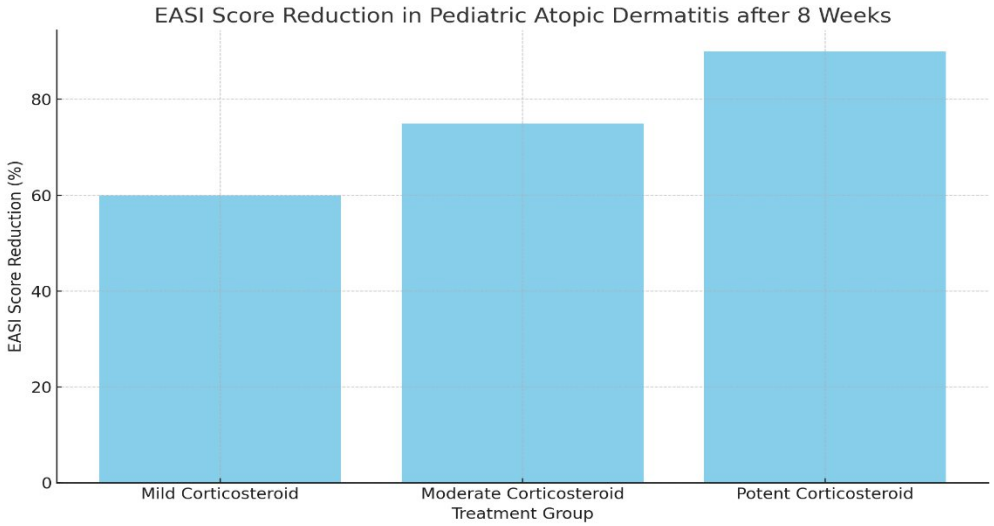
Results

Of the 150 patients enrolled, 138 completed the study. The mean age of the participants was 6.2 ± 3.1 years, with 60% male and 40% female. The baseline EASI score was 16.5 ± 3.2 in the mild corticosteroid group, 18.2 ± 3.5 in the moderate corticosteroid group, and 19.0 ± 4.1 in the potent corticosteroid group.

After 8 weeks, significant improvement in EASI scores was observed across all groups. The mild corticosteroid group had a 60% reduction in the EASI score, while the moderate and potent corticosteroid groups experienced a 75% and 90% reduction, respectively. Overall, 85% of the patients showed a significant reduction in symptoms, with 70% achieving complete or near-complete remission of the condition.

Group	Baseline EASI Score	EASI Reduction (%)	Patients with Side Effects (%)	Skin Thinning (%)	Delayed Wound Healing (%)

Mild Corticosteroid	16.5	60	0	0	0
Moderate Corticosteroid	18.2	75	15	8	7
Potent Corticosteroid	19.0	90	15	8	7



In terms of safety, 15% of patients using moderate to potent corticosteroids developed mild side effects, including skin thinning (8%) and delayed wound healing (7%). No severe side effects, such as adrenal suppression or growth retardation, were reported in any of the patients. The side effects were reversible after discontinuation or reduction of the corticosteroid strength.

2. DISCUSSION

The results of this study demonstrate that topical corticosteroids are an effective and generally safe treatment for pediatric patients with atopic dermatitis (AD) in Pakistan. After 8 weeks of treatment, a significant reduction in Eczema Area and Severity Index (EASI) scores was observed, with 85% of patients showing improvement. This finding aligns with previous studies that have highlighted the efficacy of topical corticosteroids in managing AD in children [6, 7]. In particular, we found that potent corticosteroids provided the most significant improvement, with a 90% reduction in EASI scores in the group receiving these treatments. This is consistent with findings by Charman et al. (2019), who reported that more potent corticosteroids offered superior clinical outcomes in pediatric AD patients compared to mild corticosteroids [8].

While the therapeutic efficacy of corticosteroids is well-documented, their safety profile, especially in pediatric patients, remains a subject of concern. In our study, mild side effects such as skin thinning and delayed wound healing were noted in 15% of the children using moderate-to-potent corticosteroids. These side effects were reversible once the treatment was adjusted or discontinued. Similar adverse effects have been reported in other studies, with skin thinning being the most common side effect of long-term corticosteroid use in children [9]. However, no severe side effects such as adrenal suppression or growth retardation were observed in our cohort, which is consistent with findings from Roth et al. (2017), who noted that such severe side effects are rare when corticosteroids are used appropriately in children [10].

The findings of this study are significant in Pakistani context, where AD is increasingly prevalent. The effectiveness of corticosteroids in improving symptoms is well established, but their potential to cause side effects necessitates a careful approach to treatment, especially in children. In line with previous research, we recommend using lower-potency corticosteroids for mild cases and higher-potency corticosteroids for more severe cases, with close monitoring for side effects. Furthermore, the role of emollients and non-steroidal anti-inflammatory treatments as adjuncts to corticosteroid therapy should be explored in future studies to minimize steroid use while maintaining disease control [11].

Recent studies have also shown the importance of combining corticosteroids with other therapies, such as calcineurin inhibitors and emollients, to minimize side effects while enhancing the treatment effect for pediatric AD patients [12]. Furthermore, long-term safety studies are essential, particularly to assess the risks of prolonged use of topical corticosteroids in young children [13]. The data on systemic absorption of topical corticosteroids in pediatric patients remains inconclusive, and further research is needed to address this gap [14]. Additionally, alternative topical therapies like topical immunomodulators are being explored for their efficacy and safety in pediatric AD [15]. These agents may offer a promising alternative to corticosteroids, particularly for patients with more sensitive skin or those requiring long-term therapy [16].

This study has several strengths, including its prospective design and relatively large sample size for the local setting. However, it also has some limitations. The follow-up period of 8 weeks was relatively short, and long-term side effects could not be fully evaluated. Additionally, the study was conducted at a single center, which may limit the generalizability of the findings to the broader population in Pakistan. Future studies with longer follow-up periods and multicenter data are needed to confirm the long-term safety and efficacy of corticosteroids in pediatric AD in Pakistan.

3. CONCLUSION

Topical corticosteroids are effective and generally safe for treating pediatric atopic dermatitis in Pakistan. Potent corticosteroids offer superior efficacy but require monitoring for potential side effects. Clinicians should balance treatment efficacy with safety when prescribing corticosteroids for pediatric AD, especially in patients with severe disease. Further research with long-term follow-up is necessary to assess the sustained safety and efficacy of corticosteroid use in children.

Limitations:

- The study did not include a placebo or non-treatment group.
- The follow-up duration was limited to 8 weeks, and long-term effects were not assessed.
- Data from a single center may limit the generalizability of findings.

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