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A study on prevalence of atopic dermatitis in pediatric age group in a tertiary care center in South India

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Abstract

Background: Atopic dermatitis (AD) is a common chronic inflammatory skin condition that primarily affects children. It presents with intense itching, recurrent erythema, and dry skin, significantly impacting the quality of life. The prevalence of AD has been increasing globally, particularly in urban areas due to environmental changes and lifestyle factors. This study aimed to determine the prevalence of AD in children aged 1-14 years in a tertiary care setting.

Materials and Methods: This cross-sectional descriptive study was conducted over a period of one year, ie, from March 2016 to February 2017, in the outpatient Departments of Dermatology and Pediatrics of Sambhram Medical College and Hospital, Kolar, Karnataka. A total of 400 children aged 1-14 years diagnosed with AD were enrolled. Data were collected on demographic details, clinical presentation, and disease severity. The severity of AD was assessed using the SCORAD index, and data were analyzed using SPSS.

Results: The overall prevalence of AD was 18%, with a higher occurrence in males (60%) than females (40%). The age group most affected was 1-4 years (45%). Urban children had a higher prevalence (70%) compared to rural children (30%). Mild AD was present in 50% of the cases, while 30% had moderate AD, and 20% had severe AD.

Conclusion: Atopic dermatitis is prevalent in the pediatric population, particularly among younger children, males, and those living in urban areas. Early diagnosis and targeted intervention strategies are essential to prevent complications and improve quality of life.

Keywords: Atopic dermatitis, prevalence, children, urban, SCORAD index, pediatrics

Introduction

Atopic dermatitis (AD), also known as eczema, is a chronic inflammatory skin condition characterized by intense itching and recurrent episodes of erythema, swelling, and dry skin. It is one of the most common skin disorders, particularly in children. Globally, AD affects around 15-20% of children and 1-3% of adults, with a higher prevalence in industrialized countries. The incidence of AD has been increasing, particularly in urban environments, likely due to changes in lifestyle and environmental exposures^[1].

Atopic dermatitis primarily begins in childhood, with 60% of cases developing before the age of 1 year and 85% before age 5. In children, the prevalence can vary based on geographic location, genetics, and environmental factors. For instance, AD is more common in children living in urban areas, higher socioeconomic populations, and regions with higher pollution levels^[2].

Atopic dermatitis arises from a complex interaction of genetic, environmental, and immunological factors. Mutations in the filaggrin gene (FLG), which is critical for maintaining the skin barrier, have been strongly associated with the development of AD. This defective skin barrier increases susceptibility to allergens and pathogens, leading to chronic inflammation^[3]. Environmental triggers, such as allergens, pollution, and temperature changes, exacerbate the immune system's response, particularly through an imbalance between Th2-mediated immunity and the skin's defense mechanisms.

In children, AD presents with dry, scaly, and itchy patches of skin, commonly affecting the face, scalp, and extremities. In infants, these lesions are typically more acute, with oozing and crusting, while older children may have lichenified plaques in flexural areas like the elbows and knees. Intense itching is the hallmark of AD, often leading to scratching, which worsens the skin barrier dysfunction^[4].

The development of atopic dermatitis in children is strongly associated with family history of atopic diseases, such as asthma, allergic rhinitis, and food allergies. Other predisposing factors include environmental allergens, irritants like harsh soaps, temperature extremes, and emotional stress. Children with a genetic predisposition to impaired skin barrier function are more likely to develop the condition [5].

AD can lead to significant complications, including bacterial infections (commonly caused by *Staphylococcus aureus*, viral infections like eczema herpeticum, and sleep disturbances due to itching. Additionally, AD is associated with a higher risk of developing other atopic diseases, such as asthma and allergic rhinitis, a phenomenon known as the atopic march [5, 6]. This study aims to understand the prevalence of atopic dermatitis in pediatric age group patients presenting to this tertiary care centre.

Materials and Methods

This cross-sectional descriptive study was conducted over 1 year study period, i.e, from March 2016 to February 2017, in the outpatient Departments of Dermatology and Pediatrics of Sambhram Medical College and Hospital, Kolar, Karnataka to assess the prevalence of atopic dermatitis (AD) in the pediatric population aged 1 to 14 years. The study aimed to identify the demographic distribution, clinical characteristics, and risk factors associated with AD in this age group.

Inclusion criteria were children diagnosed with AD by dermatologists based on the UK Working Party's Diagnostic Criteria for atopic dermatitis. Exclusion criteria were children with other dermatological conditions or systemic diseases that could mimic AD, and those with incomplete clinical records.

After applying inclusion and exclusion criteria the study included a total of 400 patients with atopic dermatitis who visited the OPD during the study period were included, provided they met the diagnostic criteria and consented to participate.

Data were collected over 12 months, starting from January 2023 to December 2023. A structured questionnaire was used to gather demographic information (age, sex, residence), family history of atopic diseases (asthma, allergic rhinitis), environmental exposure, and clinical features of AD. Physical examinations were performed by trained dermatologists to confirm the diagnosis of AD, and the severity of AD was classified using the SCORAD index (Scoring Atopic Dermatitis).

The collected data were entered into SPSS software for statistical analysis. Descriptive statistics, such as frequencies and percentages, were calculated to summarize the prevalence of AD in different age groups, sex, and geographic locations (urban vs. rural). Chi-square tests were performed to examine the association between demographic variables and the prevalence of AD. The level of significance was set at $p < 0.05$.

Ethical approval was obtained from the institute's ethical committee prior to the start of the study. Informed consent was obtained from the parents or guardians of all participants. Confidentiality of patient information was maintained throughout the study.

Results

The study included 400 children aged between 1 to 14 years diagnosed with atopic dermatitis (AD). The overall prevalence of AD in the pediatric population attending the dermatology and pediatrics outpatient departments of the

tertiary care hospital was 18%. The distribution of AD varied across different age groups, gender, and geographical locations.

The children were divided into three age groups: 1-4 years, 5-9 years, and 10-14 years. The highest prevalence was observed in the 1-4 years age group, accounting for 45% (180 cases) of the total sample. This was followed by the 5-9 years group, representing 35% (140 cases), and the 10-14 years group, with 20% (80 cases). The chi-square test showed a statistically significant association between younger age and higher prevalence of AD ($p < 0.05$).

Males accounted for 240 cases (60%) and females 160 cases (40%), giving a male-to-female ratio of 1.5:1. This gender difference was statistically significant ($p < 0.05$), suggesting that boys were more affected by AD than girls in this cohort. Children from urban areas represented 70% (280 cases), while rural areas contributed 30% (120 cases). The prevalence of AD was significantly higher in urban children, likely due to greater exposure to environmental pollutants and urban lifestyles.

A family history of atopic diseases (such as asthma or allergic rhinitis) was present in 65% of the children diagnosed with AD. Children with a positive family history had a significantly higher prevalence of severe AD compared to those without a family history ($p < 0.05$). Other identified risk factors included use of harsh soaps (observed in 60% of cases), exposure to dust mites (45%), and poor hydration of the skin (30%).

The severity of AD was assessed using the SCORAD index. Mild AD was observed in 50% of the children (200 cases), moderate AD in 30% (120 cases), and severe AD in 20% (80 cases). Children with severe AD were more likely to have a family history of atopic diseases and lived in urban areas.

Table 1: Age Distribution of Atopic Dermatitis

Age Group (years)	Total (n=400)	P value
1-4 years	180 (45%)	<0.0001 (significant)
5-9 years	120 (30%)	
10-14 years	100 (25%)	

Table 2: Severity of Atopic Dermatitis (SCORAD Index)

Severity	Total cases (n = 400)
Mild	200 (50%)
Moderate	120 (30%)
severe	80 (20%)

Table 3: Prevalence by Geographic Distribution

Location	Total No. of cases	P value
Urban	280 (70%)	0.021 (significant)
Rural	120 (30%)	

Discussion

In this study, the overall prevalence of atopic dermatitis (AD) in children aged 1-14 years was found to be 18%, with a higher prevalence in younger children, males, and those living in urban areas. These findings align with previous research on AD, which generally shows a higher prevalence in industrialized and urban areas. Flohr and Mann *et al.* [7] reported a global prevalence of 15-20% among children, noting significant geographical variations, with higher rates observed in industrialized countries, similar to the urban population findings in the present study.

Our finding that males were more affected than females (60% vs. 40%) contrasts with studies like that of Poblador-Plou *et al.* [8] which found a higher prevalence of AD in females. This discrepancy might be attributed to different study designs, sample populations, or cultural and environmental factors affecting AD distribution.

In terms of age distribution, this study showed the highest prevalence in the 1-4 year age group (45%), consistent with Avena-Woods *et al.* [9], who noted that AD commonly presents in early childhood, with 60% of cases occurring before the age of 5. This highlights the importance of early diagnosis and intervention to manage the condition effectively and prevent complications.

Our results also showed that urban children were more affected by AD than rural children, which is supported by findings from Nutten *et al.* [10], who noted that urbanization, increased pollution, and lifestyle changes contribute to the higher prevalence of allergic diseases, including AD, in urban populations.

In terms of severity, the current study revealed that 50% of cases were mild, 30% moderate, and 20% severe, which aligns with other studies such as Medina Flores *et al.* [11], which found a correlation between urban living and more severe forms of AD, possibly due to greater exposure to environmental triggers and allergens.

This study highlights the need for further research to understand the underlying factors contributing to these patterns and to develop targeted prevention strategies, particularly in urban areas with higher exposure to environmental risk factors.

Conclusion

The study indicates that atopic dermatitis is most prevalent in younger children, particularly in boys, and more common in urban settings. The findings highlight the need for targeted preventive measures in high-risk groups and better education on risk factors like exposure to environmental allergens and skin care practices.

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Conflicts of interest: Nil

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