Demographic and Clinical Profile of Atopic Dermatitis and Its Variants among the Paediatric patients- A Cross Sectional Study

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Abstract

Background: Atopic dermatitis (AD) is a chronic inflammatory skin condition characterized by intense itching and various clinical manifestations. It predominantly affects young children and is linked to elevated levels of IgE. Despite extensive research, the exact etiology remains unclear, though genetic and environmental factors are believed to play significant roles.

Methods: This descriptive study was conducted at Nalanda Medical College and Hospital, Patna, over an 18-month period from December 2019 to May 2021. A total of 83 patients up to 16 years old, diagnosed with AD according to Hanifin and Rajka's criteria, were included. Ethical clearance was obtained, and informed consent was secured from guardians. Patients were assessed for demographic characteristics, clinical features, and aggravating factors using structured case record forms. Data analysis focused on age distribution, duration of AD, aggravating factors, personal and family history, and clinical features.

Results: The study involved 83 patients with a mean age of 2-12 years. The mean duration of AD was 1.24 years. The condition often aggravated in winter. Key aggravating factors included photo aggravation (24.1%) and mosquito/mite exposure (15.7%). A significant proportion of patients experienced pruritus (91.6%) and lesions on extensors (65.1%). Family history of atopy was uncommon, with 71.1% having no family history. Facial erythema was present in 33.7% of patients, and 21.7% had scalp scaling.

Conclusion: This study highlights the diverse clinical manifestations and demographic characteristics of AD in a specific population. The findings reveal a predominance of younger patients, common involvement of extensor surfaces, and frequent pruritus. Seasonal aggravation, particularly in winter, and specific aggravating factors like photo exposure and mosquito bites were noted. The lack of significant family history suggests a need for further research into the genetic and environmental interplay in AD. These insights underscore the importance of personalized management strategies for effective treatment.

Keywords: Atopic dermatitis, pruritus, seasonal aggravation, photo aggravation, extensor lesions, demographic characteristics, clinical features.

INTRODUCTION

Atopic dermatitis (AD) is a persistent and recurring skin inflammation that is intensely itchy. It often appears during early childhood and has a distinct pattern of distribution that varies with age. Atopic dermatitis (AD) is a prevalent condition, impacting approximately 10-20% of youngsters in affluent nations.(1) Individuals diagnosed with AD often exhibit increased levels of total IgE, which can be significantly elevated. These elevated levels of IgE seem to be associated with the severity of the disease.(2) Patients with Atopic dermatitis (AD) may have increased levels of allergen-specific IgE, indicating sensitisation, without necessarily experiencing clinical allergy. This can lead to uncertainty in patient care, especially when it comes to food allergies.(3) The primary medical conditions that commonly occur alongside AD are infections, such as Staphylococcus aureus superinfection and

eczema herpeticum. However, patients and their families generally find continuous itching, sleep deprivation, and the costs and time required for treatment to be the most stressful aspects of the disease. Atopic dermatitis (AD) has been linked to subpar academic achievement, low self-worth, and dysfunction within the family unit.(4-7) The aetiology of AD remains inadequately comprehended, despite the fact that a hereditary inclination in conjunction with triggering environmental variables seems to be crucial. AD, like asthma and other chronic conditions, should be considered as a prevalent final outcome of several genetic abnormalities, leading to compromised function of the outer layer of the skin and disruption of the immune system. Further investigation and analysis of genetic abnormalities in individuals with AD is necessary. This could result in improved understanding of the disease and the creation of more efficient treatments.

Currently, the management strategy focusses on addressing the identified issues in AD, specifically skin barrier dysfunction and inflammation of the skin, while also treating any related infections, sometimes as a preventive measure. The itching associated with atopic dermatitis (AD) is frequently the most bothersome symptom and is managed by moisturising the skin and applying anti-inflammatory medications directly to the affected area. However, antihistamines are generally not effective in relieving itching for the majority of patients. Behavioural therapies, such as the utilisation of biofeedback and relaxation techniques, can be beneficial in effectively managing the act of scratching. While a thorough treatment approach that includes extensive education is successful in managing atopic dermatitis in the majority of children, there is a need for improved treatments, including disease-modifying drugs that can be started during early childhood.

MATERIALS AND METHOD

This descriptive study was conducted in the Department of Dermatology, Venereology, and Leprology at Nalanda Medical College and Hospital, Patna, over a period of 18-month from December 2019 to May 2021, with a sample size of 83 patients. Ethical clearance was obtained from the institutional ethical committee, and informed consent was secured from the guardians of all participants. The study included patients up to 16 years of age who were newly diagnosed with atopic dermatitis (AD) according to Hanifin and Rajka's diagnostic criteria (requiring at least three major and three minor criteria), as well as known cases of AD not on any treatment for the past month, and those accompanied by a first-degree relative or primary caregiver. Exclusion criteria involved patients or guardians unwilling to participate, patients older than 16 years, those presenting with confusing clinical features, or those who had received treatment for AD, including systemic or topical steroids, immunosuppressants, or antihistamines, within the last month. A detailed record of demographic and clinical features was maintained using a structured “Case Record Proforma,” with systematic cutaneous and systemic examinations and digital photographs taken for documentation. The diagnosis of AD was confirmed based on Hanifin and Rajka's criteria, and additional clinical features were also recorded.

RESULT

Table 1 Demographic Distribution of Patients (n=83)

Category	Subcategory	Number of Patients	Percentage (%)
Age Distribution (years)	0-2	26	31.3%
	2-12	56	67.5%
	>12	1	1.2%
Sex	Female	32	38.6%
	Male	51	61.4%
Residence	Rural	17	20.5%
	Urban	66	79.5%
Socio-Economic Status	Lower Class	7	8.4%
	Lower Middle Class	47	56.6%
	Lower Upper Class	1	1.2%
	Middle Class	24	28.9%

	Upper Middle Class	4	4.8%
Total		**83**	**100.0%**

The study involved 83 patients and examined various demographic characteristics, including age distribution, sex, residence, and socio-economic status. The age distribution was as follows: 31.3% of patients were aged 0-2 years, 67.5% were aged 2-12 years, and 1.2% were older than 12 years. In terms of sex, 38.6% of the patients were female, and 61.4% were male. Regarding their place of residence, 20.5% of patients were from rural areas, while 79.5% were from urban areas. Socio-economic status was classified into several categories: 8.4% of patients were from the lower class, 56.6% from the lower middle class, 1.2% from the lower upper class, 28.9% from the middle class, and 4.8% from the upper middle class. Overall, these data provide a comprehensive overview of the demographic and socio-economic background of the study population.

Table 2 Comprehensive Overview of AD Study Data (n=83)

Category	Subcategory	Number of Patients	Percentage (%)
Mean Duration of AD (years)		1.2406±1.3533	
Age of Onset Group (years)	<1	26	31.3%
	1-5	49	59.0%
	6-10	8	9.6%
Seasonal Aggravation	Summer	9	10.8%
	Winter	47	56.6%
	None	27	32.5%
Total		**83**	**100.0%**

The study involved 83 patients and examined various aspects of their condition. The mean duration of the condition was 1.24 years, with a standard deviation of 1.35 years, ranging from a minimum of 0.01 years to a maximum of 6 years, and a median of 0.6 years. The age of onset was categorized into three groups: 31.3% of patients had an onset before 1 year of age, 59.0% had an onset between 1-5 years, and 9.6% had an onset between 6-10 years. Regarding seasonal aggravation, 10.8% of patients experienced symptoms in the summer, 56.6% in the winter, and 32.5% had no seasonal variation. Overall, the data provide a detailed view of the duration, onset age, and seasonal patterns associated with the condition in the study population.

Table 3 Comprehensive Overview of Aggravating Factors, Personal and Family History in AD Study (n=83)

Category	Subcategory	Number of Patients	Percentage (%)
Other Aggravating Factors	Allergy to Food	1	1.2%
	Mosquito, Mites	13	15.7%
	Soap	1	1.2%
	Photo Aggravation	20	24.1%
	Mustard Oil	1	1.2%
	None	47	56.6%
Personal History of Atopy	Allergic Rhinitis (AR)	24	28.9%
	Bronchial Asthma (BA)	1	1.2%
	None	58	69.9%
Family History of Atopy	Atopic Dermatitis (AD)	3	3.6%
	Allergic Rhinitis (AR)	5	6.0%
	Bronchial Asthma (BA)	16	19.3%
	None	59	71.1%
Total		**83**	**100.0%**

The study evaluated 83 patients for various aggravating factors, personal history, and family history related to atopic dermatitis (AD). Among the other aggravating factors identified, 1.2% of patients had allergies to food, 15.7% were affected by mosquito and mite exposure, 1.2% by soap, 24.1% by

photo aggravation, and 1.2% by mustard oil, while 56.6% reported no aggravating factors. In terms of personal history of atopy, 28.9% of patients had allergic rhinitis (AR), 1.2% had bronchial asthma (BA), and 69.9% had no personal history of atopy. Regarding family history, 3.6% had a family history of atopic dermatitis, 6.0% had a family history of allergic rhinitis, 19.3% had a family history of bronchial asthma, and 71.1% had no family history of atopy. Overall, this data provides insights into the various factors influencing atopic dermatitis in the study population.

Table 4 Comprehensive Overview of Clinical Features in AD Study (n=83)

Category	Subcategory	Number of Patients	Percentage (%)
Sites Involved	Extensors	54	65.1%
	Flexures	17	20.5%
	Flexures + Extensors	12	14.5%
Facial Erythema	No	55	66.3%
	Yes	28	33.7%
pruritus	No	7	8.4%
	Yes	76	91.6%
Xerosis	No	45	54.2%
	Yes	38	45.8%
Scalp Scaling	No	65	78.3%
	Yes	18	21.7%
Tendency for Cutaneous Infection	No	70	84.3%
	Yes	13	15.7%
Total		**83**	**100.0%**

The study assessed 83 patients with atopic dermatitis (AD) to identify the sites involved, presence of facial erythema, pruritus, xerosis, scalp scaling, and tendency for cutaneous infections. Among the sites involved, 65.1% of patients had lesions on the extensors, 20.5% on the flexures, and 14.5% on both flexures and extensors. Regarding facial erythema, 33.7% of patients had it, while 66.3% did not. pruritus was a common symptom, present in 91.6% of patients, with only 8.4% not experiencing it. Xerosis was observed in 45.8% of patients, whereas 54.2% did not have xerosis. Scalp scaling was noted in 21.7% of the patients, while 78.3% did not exhibit this feature. Additionally, 15.7% of the patients showed a tendency for cutaneous infections, while 84.3% did not. This data provides a detailed overview of the clinical features associated with AD in the study population.

DISCUSSION

The present study was conducted in the department of Dermatology, Veneorology and Leprology, Nalanda Medical College and Hospital, Patna for 18 months (December 2019 to May 2021). We enrolled individuals aged up to 16 years who expressed their willingness to participate in the study. These patients were newly diagnosed and had not received any treatment for AD. The diagnosis of AD was based on HANIFIN and RAJKA'S diagnostic criteria, which required the presence of at least three major and three minor criteria. The study included patients who had either a

first degree relative or were directly involved in managing or taking care of the patient. Out of a total of 67,500 patients that visited the skin outpatient department, there were a total of 124 patients with Atopic Dermatitis (AD) who were between the ages of zero months and 16 years. The prevalence of Atopic dermatitis (AD) was determined to be 1.8% in my study.

A total of 83 patients were enrolled in our study. The analysis of the conducted study is as follows: The investigation revealed that among the patients, 26 (31.3%) were between the ages of 0-2 years, 56 (67.5%) were between the ages of 2-12 years, and 1 (1.2%) patient was older than 12 years. This finding is comparable to the research conducted by Sehgal VN et al 46(2015), which indicated that 83% of the participants were between the ages of 2 and 12 years. The average age of patients with Atopic dermatitis (AD) was determined to be 3.698 years with a standard deviation of 3.0. This result is consistent with other research conducted in India, like the one conducted by Bhawna Lochav and Bhaskar Gupta. In this study, 26 (31.3%) of the patients had Atopic dermatitis (AD) with an age of onset below 1 year. Additionally, 49 (59%) patients had an age of onset within the 5-year age bracket, indicating that the disease primarily affects young children.Rajka's study revealed that 60% of the participants experienced the condition within the first year of their lives, while 85% developed it by the age of 5.

This study demonstrated a significant preponderance of males over females in AD, with 33 (38.6%) patients being female and 51 (61.4%) patients being male. The study found a male to female ratio of 1.5:1, which aligns with the findings of Sarkar and Kanwar11 and Sehgal VN et al 46(2015).In another investigation, the ratio was shown to be 1.3:1. The higher prevalence of males observed in hospital-based Indian epidemiological research may be attributed to a greater tendency for boys to seek medical treatment compared to females.

This study revealed that a significant proportion (79.5%) of the patients resided in metropolitan regions. This finding is consistent with numerous investigations, including the research conducted by Todd et al. and Poysh et al. Sehgal VN et al 46(2015) shown that 70% of the participants had an urban background, whereas 30% had a rural background. William discovered a positive correlation between the prevalence of AD and socioeconomic advancement.A similar finding was published by Spergel et al, who discovered that the prevalence of AD had tripled over the preceding three decades in industrialised countries. This increase can be attributed to improvements in socioeconomic conditions and lifestyle. Our analysis revealed that 7 patients (8.4%) belonged to the Lower Class, 47 patients (56.6%) belonged to the Lower Middle Class, 1 patient (1.2%) belonged to the Lower Upper Class, 24 patients (28.9%) belonged to the Middle Class, and 4 patients (4.8%) belonged to the Upper Middle Class.This is analogous to an Indian study conducted by Sarkar and Kanwar. In this study, 91.6% of patients with AD reported experiencing itching, which was the primary symptom observed in my study. This finding is consistent with similar studies conducted in India and other regions worldwide.

Out of the patients with AD, 9 (16.1%) experienced aggravation during the summer, while 47 (83.9%) experienced aggravation during the winter. A significant proportion of patients with Atopic dermatitis exhibited a worsening of symptoms throughout the winter season. Sarkar and Kanwar noted that winter exacerbation was a recurring characteristic in patients with atopic dermatitis (AD). Dhar and Kanwar also observed a worsening of symptoms throughout the winter season.TwelveThe study revealed that out of the patients with AD, 1 (1.2%) experienced worsened symptoms due to diet, 13 (15.7%) experienced aggravation from mosquito and mite exposure, 20 (24.1%) experienced aggravation from exposure to light, 1 (1.2%) had worsened symptoms due to mustard oil, and 1 (1.2%) experienced aggregation of symptoms due to soap use.

Out of the total number of patients in this study, 24 (28.9%) had a history of allergic rhinitis (AR) and atopy, while 1 (1.2%) patient had a history of bronchial asthma (BA) and atopy. The current investigation revealed that 3 patients (3.6%) had AD, 5 patients (6.0%) had AR, and 16 patients (19.3%) had a family history of BA. In contrast, Hanifin and Rajka demonstrated that 50% of patients with AD had a personal history of atopy. Dhare et al observed that 40% of the individuals showed a

familial predisposition to atopy. Rystedt et al demonstrated that 32% of patients with AD had bronchial asthma, while 60% experienced allergic rhinitis. Ellis et al. discovered that allergic rhinitis was present in 7% of patients with AD, whereas asthma was present in 5% of patients with AD, both being the most frequently occurring comorbidities. The study found that 54 patients, or 65.1% of the total, had lesions on their Extensors. Additionally, 17 patients, or 20.5%, had lesions on their Flexures. Furthermore, 12 patients, or 14.5%, had lesions on both their Flexures and Extensors. Out of the total, 28 individuals, which accounts for 33.7% of the sample, exhibited facial erythema.

This study demonstrated that the average duration of AD was 1.2406±1.3533, as indicated by the mean and standard deviation.Therefore, it is a persistent condition characterised by recurrent recurrences.

The study primarily saw 13 patients (15.7%) who had a predisposition for cutaneous infection, according to the minor criteria of Hanifin and Rajka. A total of 18 individuals, accounting for 21.7% of the sample, experienced scalp scaling.

A total of 76 patients, accounting for 91.6% of the sample, had pruritus. A total of 38 patients, accounting for 45.8% of the sample, exhibited Xerosis. Hyper-linearity was present in 29 cases, accounting for 34.9% of the total. Out of the total number of patients, 5 individuals, accounting for 6.0% of the sample, were diagnosed with ichthyosis. Bayonne-Kombo ES et al. (2019) 89.33% of all patients exhibited xerosis. Secondary infection occurred in 33.33% of patients.

CONCLUSION

Our study on 83 patients with atopic dermatitis (AD) at Nalanda Medical College and Hospital reveals a diverse demographic and clinical profile. The majority of patients were aged 2-12 years, with a significant proportion presenting with lesions on extensors and experiencing pruritus and facial erythema. The mean duration of AD was 1.24 years, and the condition often aggravated in winter. Factors such as photo aggravation and a personal history of allergic rhinitis were notable, while most patients did not have family histories of atopic conditions. The findings underscore the varied clinical manifestations and the impact of environmental and personal factors on AD, highlighting the need for tailored management strategies in this population.

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