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Original research article

Incidence and risk factors of atopic dermatitis among children in northern India

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Abstract

Background: Atopic dermatitis (AD) is a highly pruritic, chronic inflammatory, non-communicable and relapsing skin disease that affects all age groups, posing a significant burden on health-care resources and patients' quality of life (QoL).

Objective: To study the clinical features, various risk factors, and their correlation with the severity of atopic dermatitis in northern Indian children.

Materials and Methods: This is a prospective, descriptive study conducted in the department of Dermatology in a tertiary care teaching hospital in northern India. The study population included 380 atopic dermatitis patients upto 15 years of age attending the Out Patient Department of Dermatology.

Results: The incidence of AD was 8.92%. Most of the patients (80.1%) were below six year of age. Male: Female ratio was 1.3:1. 50.5% of patients belonged to middle socio economic class, 58.9% of patients were from urban area. Family history of atopy was noted in 52.1% cases. 94.4% of patients have Pruritus and 88.9% had Chronic relapsing eczema. The most common site of involvement was face (70.5%), 64.2% of AD patients had mild disease**.**

Conclusion: This guidance focuses on identifying the unmet gaps and provides practical recommendations for improving QoL, diagnosis, prognosis, and overall management of patients with AD in India.

Keywords: Atopic dermatitis**,** Incidence**,** Risk factors, clinical pattern, children

Introduction

Atopic dermatitis (AD), also called atopic eczema, is a common chronic or recurrent inflammatory skin disease and affects children, adolescents and frequent in adults worldwide. It is characterized by acute flare-ups of eczematous pruritic lesions over dry skin [1-2]. AD is non-communicable; it is often associated with other allergic conditions and is one of the earliest manifestations of the "atopic march". Most AD patients usually have personal and/or family history of atopic diseases like asthma (AS) and allergic rhinitis (AR). [3-4]. There is no laboratory "gold standard" test for the diagnosis of AD, with some diagnostic difficulties and may be laborious to distinguish from other skin diseases. The diagnosis of AD is based on a constellation of signs and symptoms [5-6]. A rising trend in AD has also been observed in India in last four decades. The current prevalence of Atopic dermatitis in most high-income and some low-income countries is approximately 10-30% in children and 2-10% in adults, representing 2-3 fold increase over the past several decades [7]. AD developed during childhood is characterized by eczematous lesions on the flexural areas, nape of the neck, dorsum of the feet and hands; whereas, lichenified/exudative flexural dermatitis alone or associated with head/neck, and hand eczema, and the prurigo nodularis (PN)-like AD are commonly observed in adult patients with AD. Owing to these manifestations, patients with AD may experience. Itching, sleep disturbances, poor performance at school/ work, and disturbed social, mental, and emotional functioning [8-9]. AD etiology remains obscure; it is considered a multifactorial disease [10].

AD poses a significant burden on health-care resources and patients' quality of life (mainly because of sleep deprivation due to itchiness, employment loss, time to care and financial costs) [11-12]. The Hanifin-Rajka Criteria was the earliest AD diagnostic model and reported high sensitivity and specificity of up to 96.0% and 93.8%, respectively [13]. The risk factors of AD were family history of AD, history of asthma or/and allergic rhinitis, history of respiratory infections (bronchitis, pneumonia, sinusitis, otitis), exposure of smoking at home, animals at home (dog, cat, others), frequency of truck traffic in home street, age of mother at participant's birth, presence of older siblings, occupational social class base on parents' occupation, town of residence and presence of ceramic industry in the town of residence [14].

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Aims and Objectives

In this study, we studied the clinical and the epidemiological profile of AD and we tried to identify the various risk factors which were associated with the severity of atopic dermatitis in children's of northern India.

Materials and Methods

This hospital based, prospective study was carried out in the Outpatients Department (OPD), of the Department of Dermatology and Department of Pediatrics, at Tertiary care Hospital, northern India, for a period of one year. After taking an informed written consent from the guardians of the every patient, all the patients were enrolled on a pre structured proforma. This proforma included the data on the present age, the age at onset of the disease, the area of residence, triggering factors, the personal and the family history of the atopy, the seasonal variation, the religion of the patient, the development of milestones, the socioeconomic status of the parents and the history of relapse.

A thorough clinical examination was done, which included the distribution of the lesion, severity of the skin lesion and the type of the skin lesion. In every patient, the diagnosis of AD was confirmed by Hanifin and Rajka's criteria.

Inclusion Criteria

1. Clinically diagnosed cases of Atopic dermatitis according to Hanifin and Rajka's criteria.
2. Patients lees than or equal to 15 years of age

Exclusion Criteria

1. Patients more than 15 years of age
2. Patients with Contact dermatitis, Stasis eczema, Lichen Simplex Chronicus, Infective eczema.

Statistical analyses

The data were analyzed by using the Open Epi statistical software, version 22. The mean and standard deviation were calculated by using appropriate statistical methods. A P value of < 0.05 was considered as statistically significant.

Results

A total of 4260 pediatric patients of upto 15 years of age, who were seen in the Outpatients Department (OPD) of the Department of Paediatrics and the Department of Dermatology during the study period, were enrolled in our study.

Incidence of atopic dermatitis in our study was 8.92% (380/4260). Among these 380 patients, 214 (56.3%) were male and 166 (43.7%) were female, with a male to female ratio of 1.3: 1. Most of the (58.9%) patients belonged to urban areas, while 41.1% patients belonged to rural areas. Socioeconomically, 50.5% were from middle socio-economic groups [Table: 1].

Table 1: Socio-demographic variables of the atopic dermatitis patients

Socio-demographic variables		Frequency	Percentage (%)
Age group	0 to 1 Years	140	36.8%
	1 to 5 Years	172	45.3%
	5 to 10 Years	52	13.7%
	10 to 15 Years	16	4.2%
Gender	Male	214	56.3%
	Female	166	43.7%
Residential area	Urban	224	58.9%
	Rural	156	41.1%
Socio-economic status	Upper	76	20%
	Middle	192	50.5%
	Lower	112	29.5%

Site of lesions in the atopic dermatitis were 70.5% on facial region, 45.3% on upper limb, 42.1% over lower limb and 28.9% on flexures surface [Table: 2].

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Table 2: Sites of Distribution of lesions in the atopic dermatitis

Sites	Number of Cases	Percentage (%)
Flexures	110	28.9%
Extensors	102	26.8%
Facial	268	70.5%
Seborrhoeic	56	14.7%
Trunk	50	13.2%
Upper limb	172	45.3%
Lower limb	160	42.1%
Generalized	14	3.7%

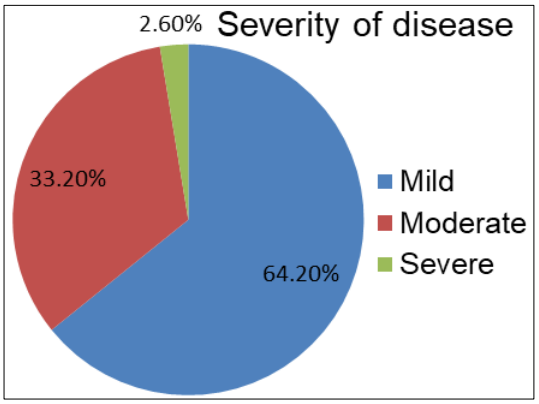

Fig 1: Severity of the atopic dermatitis

Majority of the patients (64.2%) atopic dermatitis was mild in nature, 33.2% moderate and only 2.6% were severe AD [Figure: 1].

Clinical presentation of AD was, 96.3% of patients had Pruritus, 88.9% of patients had chronic or chronically relapsing course, 70% of patients had family history of atopy and 66.3% of Excoriation of Skin [Table:3].

Table 3: Common clinical presentation of atopic dermatitis

Clinical Feature	No of Patients (N= 380)	Percentage (%)
Pruritus / Itching	366	96.3%
Chronic relapsing eczema	338	88.9%
Family History of atopy	266	70%
Excoriation of Skin	252	66.3%
Dryness of the skin	242	63.7%
Flexural Lichanification	176	46.3%
Ichthyosis	114	30%
Recurrent conjunctivitis	40	10.5%

Family history atopic dermatitis (52.1%) was the most common risk factor of AD followed by History of respiratory infections (38.9%), History asthma and/or allergic rhinitis (35.8%) and Family smoke at home (27.9%) [Table: 4].

Table 4: Risk factors of new cases of atopic dermatitis

Risk factors	No of Patients	Percentage (%)
History asthma and/or allergic rhinitis	136	35.8%
Family history atopic dermatitis*	198	52.1%
History of respiratory infections	148	38.9%
Family smoke at home	106	27.9%
Animals at home	94	24.7%
Presence of AD in older siblings	52	13.7%
Constant truck traffic in home's street	34	8.9%
History of food allergy	28	7.4%

Discussion

The incidence of atopic dermatitis among patients attending the Out Patient Department in our study was 8.92% which was in accordance with the study done by Lim *et al.*, [15] and Mani Kant Kumar *et al.*, [16], reported incidence of AD 13.5% and 7.3% respectively. In contrast to the findings of our study, some other studies like Dhar S *et al.*, [17] and Sarkar R *et al.*, [18], observed higher incidence of AD, 28.46% and

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29.9% respectively, whereas Sinha PK *et al*., [19] and Mandal B *et al*., [20], reported very low incidence 0.38% and 0.55% respectively. This variation may be due to "Hygiene Hypothesis, environmental factors and food habits.

Most of the patients (80.1%) belonged to below 6 year of age, concordance with the Rajagopalan *et al*., [21] and Sehgal VN *et al*., [22].

Males (56.3%) outnumbered females (43.7%) in our study with sex ratio 1.3:1. Results of our study are almost comparable with the study done by Swamy AV *et al*., [23], Kaujalgi R *et al*., [24] and Rajka G *et al*., [25], observed male predominance in their study.

Present study found a higher incidence of AD in the Urban areas, similar to the Todd G *et al*., [26] and Sarkar R *et al*., [18] AD is more common in urban areas compared to rural areas. This is probably because, urban population is more exposed to AD triggering factors like psychological stress, environmental pollution, industrialization, wearing more of synthetic clothes.

Majority of the patients in this study belonged to middle class families, constant finding also observed by Sarkar and Kanwar *et al*., [18] and Kanwar AJ *et al*., [27].

In our study 64.2% of patients, AD was mild in severity and 33.2% of patients had moderate severity of AD. Present study results are almost similar to the studies done by Swamy *et al*., [23] and Dhar S, *et al*., [28], in contrast to Weber MB *et al*., [29] showed, 22.70% of patients with mild AD, 52.30% of patients with moderate AD. These variations in the severity of disease can be attributed to genetics, environmental factors, temperature, humidity, food habits, clothing and psychological factors.

Pruritus was the most common (94.4%) clinical presentation found in our study, accordance with the Sharma L *et al*., [30] and Kumar MK *et al*., [31]. Pruritus is an essential feature of AD and is an important part of Hanifin and Rajka's major criteria.

In current study, majority of the patients (70.5%) in the infantile AD group had facial involvement, concordance with the Yazganoglu *et al*., [32].

In the present study major associated risk factor of AD were Family history atopic dermatitis, History asthma and/or allergic rhinitis and History of respiratory infection, consistent finding reported by Arnedo-Pena *et al*., [33] and Koskelo M *et al*., [34].

Conclusion

Atopic dermatitis is a multifactorial disease that disproportionately affects health-related Quality of life and social, mental, and emotional functioning in both, patients and parents/caregivers. Considering AD complexity, a global approach has been proposed to study its prevention, diagnosis, and treatment, including genetics, immune and environmental factors.

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