Original Article

Prevalence and Risk Factors of Chronic Eczema in Urban and Rural Populations

Siddiqui MMR[1], Shaheen MNI[2], Babar ZUM[3]

Abstract

Background: *Eczema affects around 10% of children in Western countries and has become much more common in developing countries in recent years. Numerous factors have been identified as contributing to the rising prevalence of eczema and other atopic diseases. It has been proposed by the hygiene hypothesis that eczema occurs more frequently in urban areas than in rural ones. Therefore, we studied the prevalence and risk factors of chronic eczema among the adult population living in urban and rural areas.* ***Materials and Methods:*** *This was a retrospective observational study conducted in the Department of Dermatology, Eastern Medical College Hospital, Cumilla, Bangladesh during the period from July 2023 to June 2024. In this study, we included 100 suspected patients of chronic eczema attending the dermatology department coming from urban and rural areas.* ***Results:*** *Most of our study patients (61%) were female followed by male (39%). The mean age was 46.32±14.02 & 44.32±16.02 years in urban & rural groups respectively. The most common symptom was an itchy rash reported by 62% & 44% of urban & rural patients respectively. The prevalence of eczema was 68% & 56% and chronic eczema was found in 24% & 18% of urban & rural groups respectively. Family history (80.43% vs 78.38%), antibiotics used more than 3 times per day (50% vs 56.76%), and environmental factors (54.35% & 43.24%) were the most common risk factors among our urban & rural populations respectively.* ***Conclusion:*** *This study shows that the prevalence of chronic eczema appears to vary significantly between urban and rural populations, influenced by environmental, genetic, and lifestyle factors.*

Keywords: Prevalence, Risk Factors, Chronic Eczema, Urban, Rural.
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Introduction

Eczema affects up to 10% of adults and up to 20% of children and adolescents in Western countries and has become much more common in developing countries in recent years[1-4]. Numerous factors have been identified as contributing to the rising prevalence of eczema and other atopic diseases. Even though genetic predisposition is probably a major factor in inflammatory reactions and skin barrier failure, these factors by themselves cannot explain the dramatic increase in disease incidence[5].

The 'hygiene hypothesis' is a leading theory for the rising prevalence of eczema and other atopic conditions[6-9]. This theory suggests that modern hygienic environments provide insufficient microbial exposure to stimulate a newborn's immune system. Without these signals, the immune system is less likely to shift from type 2 responses to regulatory or type 1 T-cell responses, which increases the risk of developing eczema. Over the past five decades, industrialization, urbanization, and improved living standards have significantly advanced in the Western world, and similar changes are now taking place in developing countries. Evidence already points to a growing prevalence of eczema in these regions[9]. As part of the hygiene hypothesis, it has been proposed that eczema occurs more frequently in urban areas than in rural ones, but this idea has not been systematically studied[10].

Atopic dermatitis (AD), the most common type of eczema, is a chronic, inflammatory cutaneous disorder that typically begins in early childhood, with a prevalence of 7-10%[11]. Numerous comorbidities and clinical symptoms, including skin lesions, are linked to AD and significantly impact an adult's quality of life[12]. AD has been associated with anxiety, depression, and suicidal thoughts, contributing significantly to decreased work productivity and higher global healthcare costs[13,14]. Traditionally, AD is considered a disease of childhood that remits in adolescence and adulthood[15]. Although 60-75% of individuals eventually outgrow AD as they age, some continue

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to experience symptoms into adulthood[15-17]. Additionally, one in four adults with AD report developing the condition in adulthood.[15,17].

Only a small number of studies looked at the epidemiology of AD in adults. Surprisingly, few research has investigated the epidemiology of AD in adults. Studies in the United States, Europe, Japan, Italy, and Sweden found that adult prevalence was lower than that of children[18-20]. Adult AD usually differs from the normal pattern of childhood AD, and it also has distinct risk factors, clinical features, genetics, and comorbidities. However, there are not many of this research conducted in Bangladesh. Therefore, in this study, we aimed to identify the prevalence and risk factors of chronic eczema among the adult population living in urban and rural areas.

Materials and Methods

This was a retrospective observational study conducted in the Department of Dermatology, Eastern Medical College Hospital, Cumilla, Bangladesh during the period from July 2023 to June 2024. Ethical approval was taken from the ethical review board of EMC. In our study, we included 100 suspected patients of chronic eczema attending the dermatology department coming from urban and rural areas.

These are the following criteria to be eligible for enrollment as our study participants: a) Patients aged more than 18 years; b) Patients with chronic eczema symptoms; c) Patients who came from urban & rural areas; d) Patients who were willing to participate were included in the study. Patients with coagulopathy or receiving anticoagulants, with rare allergies, with any history of acute illness (e.g., renal or pancreatic diseases, ischemic heart disease, COPD etc.) were excluded from this study. Informed written consent was obtained from all patients, and all data was systematically recorded using the pre-designed data collection form. Quantitative data was expressed as mean±standard deviation and qualitative data was expressed as frequency distribution & percentage. The differences between groups were analyzed by chi-square (χ^2) test etc. A p-value of less than 0.05 was considered statistically significant. Statistical analysis was conducted using SPSS V23 (Statistical Package for the Social Sciences) for Windows.

Results

The majority (35%) of our patients were in the age group of 41-50 years, followed by 23% of them aged 31-40 years, 19% & 18% of patients were in the >50 & 21-30 years age group respectively. Only 5% of patients were aged ≤20 years old. The mean age of our patients was 47.32±13.02 years, with a p-value of 0.01 which is significant (Figure 1). The pie chart shows that most of our study patients (61%) were female and 39% were male. The male and female ratio was 1:1.5 in the study (Figure 2).

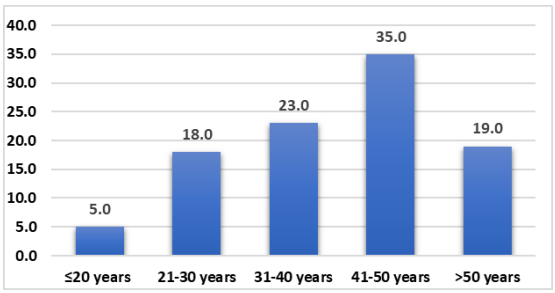

Figure-1: Age distribution of the study subjects (n=100)

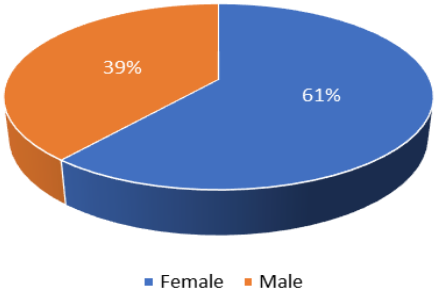

Figure-2: Gender distribution of the study subjects (n=100)

Table I shows the distribution of study patients by demographic characteristics. The mean age was 46.32±14.02 & 44.32±16.02 years in urban & rural groups respectively. Among the urban population, 48% had higher education, while 54% had low education. Among urban & rural populations, 56% & 68% were married, and 48% & 44% had medium sociodemographic status respectively. The family history of eczema was present in 74% & 58% of urban & rural population respectively. The most common presenting symptom was an itchy rash (3-6 months of prevalence), reported by 62% & 44% of urban & rural patients, followed by wheezing (34% vs 26%), and night cough (32% vs 22%) respectively. The prevalence of eczema was 68% & 56% and chronic eczema was found in 24% & 18% of urban & rural groups respectively.

Table II shows that family history was the most common (80.43% vs 78.38%) risk factor among our urban & rural populations respectively. Followed by antibiotics use more than 3 times per day (50% vs 56.76%), and environmental factors (54.35% & 43.24%) in urban & rural populations respectively. Among the urban population, stress/anxiety (52.17%), smoking habit (39.13%), and climate (30.43%) acted as low-risk factors while in the rural population, environmental factors (43.24%), smoking habit (37.84%) and asthma/rhinitis (24.32%) acted as low-risk factors with lower incidence.

Table-I: Demographic characteristics of study subjects (n=100)

Demographic characteristics	Urban		Rural		p-value
	n=50	%	n=50	%	
Mean age (years)	46.32±14.02		44.32±16.02		0.001[s]
Gender					
Male	17	34	22	44	0.132[ns]
Female	33	66	28	56	
Education level					
Low	11	22	27	54	0.071[ns]
Medium	15	30	14	28	
High	24	48	9	18	
Marital Status					
Married	28	56	34	68	0.042[s]
Unmarried	17	34	12	24	
Divorced/Widowed	5	10	4	8	
Sociodemographic status					
Low	17	34	19	38	0.412[ns]
Medium	24	48	22	44	
High	9	18	9	18	
Smoking habit	18	36	14	28	0.321[ns]
Family history of eczema	37	74	29	58	0.014[s]
Symptoms					
Itchy rash (3-6 months prevalence)	31	62	22	44	0.97[ns]
Wheezing	17	34	13	26	
Night cough	16	32	11	22	
Eczema	34	68	28	56	0.003[s]
Chronic Eczema	12	24	9	18	0.001[s]

p-value obtained from 't' test and $\chi 2$ test; s=significant; ns= non-significant

Table-II: Assessment of risk factors for diagnosed eczema patients (n=83)

Risk Factors	Urban		Rural		p-value
	n=46	%	n=37	%	
Family history of eczema	37	80.43	29	78.38	0.014[s]
Antibiotics use (>3/year)	23	50.00	21	56.76	0.021[s]
Stress/Anxiety	24	52.17	8	21.62	0.084[ns]
Smoking habit	18	39.13	14	37.84	0.06[ns]
Climate (Extreme heat or cold)	14	30.43	7	18.92	0.07[ns]
Environmental factors (Exposure to irritants and allergens, such as dust mites, & pet dander)	25	54.35	16	43.24	0.012[s]
Medium education	7	15.22	6	16.22	0.027[s]
Low socioeconomic status	4	8.70	5	13.51	0.041[s]
Asthma/Rhinitis	8	17.39	9	24.32	0.034[s]

p-value obtained from $\chi 2$ test; s=significant; ns= non-significant

Discussion

Atopic dermatitis (AD) is a group of conditions that lacks a recognized clinical definition. Since the terminology for adult AD has only just been established and there is still a lack of awareness and misconception about the illness, diagnosing it can be challenging[15-17]. As in other studies, two criteria were utilized in this investigation to encompass all the features of the eczema sickness spectrum[21]. The term "eczema" describes a host of ill-defended skin lesions, and encompasses the acute, subacute, and chronic lesions present in AD[17]. The present study for the first time assessed the prevalence of adult chronic eczema in rural and urban areas. We found the prevalence of chronic eczema was 24% & 18% of urban & rural groups respectively. The prevalence found in this study was within the range reported for South America[22]. Differences between rural and urban areas indicated higher prevalences for urban areas compatible with the hygiene hypothesis, although the difference was smaller in comparison with previous studies[23].

However, adult eczema has distinct clinical characteristics as compared to child-onset eczema[15]. Herein, we found an overall prevalence of adult

eczema (42%) in the urban (24%) & rural (18%) areas respectively. The US National Health Interview Survey indicates that 10.2% of individuals suffer from eczema[21]. In Italy, eczema affects 8.1% of people[19]. An international, cross-sectional, web-based investigation found that the overall prevalence of AD in adults was 4.9%[24]. According to a study done in Japan, the UK Working Party estimates that 3% of adults have AD[25]. In Sweden, 11.5% of individuals self-reported having eczema[20]. These surveys provide different descriptions of the epidemiological features of AD, which may help us better understand illness in different geographic locations. A nationwide study of adolescents in China found AD in 2.5% of subjects[26]. According to our research, the greater prevalence of adult eczema among urban residents suggests that eczema is becoming more common in certain geographic regions, maybe due to higher pollen concentrations. Recent studies have shown that AD is more than simply a childhood illness. In Italy, adult-onset AD accounted for over half of all cases[19]. The variation in the prevalence of AD in adults suggests that socioeconomic and environmental factors are involved. Our study revealed that the age groups of 29–39 years old had the highest prevalence of AD, whereas the age groups of >50 years old had the second lowest prevalence, which is consistent with a global survey of adult AD[24].

Urbanization was associated with an increased prevalence of eczema in urban people compared to rural people, which is consistent with previous studies[18,20]. All of these findings indicate that rapid urbanization and industrialization could play a role in the onset of eczema. The hygiene theory explains this phenomenon by arguing that early environmental antigens are crucial to the development of the immune system. It is believed that urbanization and industrialization reduce early antigen exposure, which is the root cause of atopic diseases and immune dysfunction[27]. An additional factor is the increasing exposure to air pollution. Pollutants such as NO_2, heavy traffic, and exposure to diesel exhaust could damage the skin barrier, increase trans-epidermal water loss, and increase the production of IgE[28-30].

This study analyzed environmental and socioeconomic factors, identifying several risk factors linked to eczema, such as moderate education levels and low household incomes. The findings suggest that eczema prevalence increases with higher socioeconomic status in both adults and children[28-30]. Antibiotic overuse was found to be associated with a higher prevalence of eczema in the urban population compared to the rural population. Chen et al found antibiotic overuse associated with increasing prevalence of allergic rhinitis and asthma in their study[31]. In summary, the risk factors determined by this study were younger age, a family history of eczema, a medium level of education, urbanization, and excessive use of antibiotics.

Limitation

This study was a single-center study with a small sample size. After assessing those patients, we did not continue with long-term follow-up.

Conclusion

The prevalence of chronic eczema appears to vary significantly between urban and rural populations, influenced by environmental, genetic and lifestyle factors. Urban living is often associated with higher prevalence rates, potentially due to greater exposure to pollutants, altered microbial environments, and lifestyle factors that limit immune system stimulation, while rural populations may benefit from greater microbial diversity and outdoor exposure, which could contribute to a protective effect against eczema. However, there is a complicated relationship between these factors and the frequency of eczema that varies according to the socioeconomic and geographic context.

Recommendation

Further research with a prospective and longitudinal study design, involving a larger sample size, is necessary to identify modifiable risk factors and help reduce the prevalence of chronic eczema in diverse populations.

Conflict of Interest

The authors declared that they have no conflicts of interest.

Acknowledgment

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