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Factors Associated with Atopic Dermatitis in Childhood aged 0-5 years –A Cross Sectional study in Bangobondhu memorial hospital, Chittagong, Bangladesh.

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Abstract

Background: ***Atopic*** *dermatitis (AD) is a chronic skin disorder and one of the most prevalent type of eczema. More than 14 % of people in Bangladesh suffers atopic dermatitis which is mostly visible as a red, itchy rash normally on the arms, limbs, cheeks and legs even any external parts on the human body.[1] Atopic dermatitis typically started from childhood within the first six months of a baby's life. Although, it's a common form of eczema, it lasts longer and its onset of action is very severe. Children are mostly exposed in AD.[2] Objective: The study was to identify the childhood prevalence of atopic dermatitis and responsible factor associated with the diseases.*

Methods: *The Study was a cross sectional study. The study was conducted in outdoor department of Bangobondhu Memorial Hospital, Chittagong, Bangladesh. It was started from January, 2014 to January 2016. We have identified several under five children coming in the hospital outdoor with skin problem and identified atopic dermatitis based on clinical and physical examination. Data was collected by filling up through collecting information from mothers/guardian and children*

Results: *The prevalence of AD was 9.05% in children aged less than 5 years. 110cases of atopic dermatitis were extracted from 1215 outdoor patients and analyzed. The mean age of patients was 3.2 years. Sex ratio was 0.7. Personal history of Atopic Dermatitis was noted in 16 cases (18%). During winter (January to March) had the highest risk (38.18%) and also after winter its incidence was decreased (p=.005). Study revealed that the prevalence of atopic dermatitis in urban and rural areas was nearly the same. Conclusion: Bangladesh is a tropical country .Its seasonal variation impacts every life in the region. The prevalence of Atopic dermatitis had also impact on children. Especially winter season,It was increasing. Moreover, others factors specially allergic rhinitis, allergy, hereditary history prevails the significant impacts of the prevalence of AD*

Key words: Dermatitis, Asthma, Allergic Rhinitis, Eczema

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I. Introduction

Atopic Dermatitis is one of the chronic skin disorder which was seen normally on legs, checks,upper part of body, limbs ,arms and even some cases it spreads any part of the human body. The most common symptoms is frequent itching with reddish or eczema formed and lasts longer.Globally, 20% of children and 3% of adults are affected by atopic dermatitis.[3]Phase Three of the ISAAC study[4] showed that AD specifically in young children aged 6-7 have relatively highest prevalence as compared to age 13-14 years in low-income countries, such as South East Asia in the follow-up data[5].But still there have insufficient data on prevalence of AD with under five children and its associated factors. Exactly the causes of atopic dermatitis is multifaceted. Most researchers assumed that Atopic dermatitis was prevailed due to environmental factors acting in people who are genetically predisposed to the disease. Heredity is an important biological risk factor in the development of immune sensitization and allergy.[6] Although , there has nothing specified on age dependency for aggravating Atopic Dermatitis , but It was mostly suggested that Atopic dermatitis is grown in between 2 and 6 months[7].Previously It was suggested that AD with childhood was resolved by adulthood in most cases, but evidence suggests that it is a chronic condition that may persist into adulthood[8]. Several factors such as environmental exposures (use of personal care products, climate exposure, pollution, food etc) and genetics attribute to the increased global prevalence of AD in predisposed individuals[9]. Study was aiming to identify and calculate the prevalence and responsible factors associated of atopic dermatitis in Chittagong, Bangladesh. Children of parents with atopic dermatitis have an increased risk of developing atopic dermatitis by age 3 years. [10] Much higher concordance rates for atopic dermatitis are observed in monozygotic twins (77%) than in dizygotic twins (15%).[11]In Bangladesh in 2017, there were reached 3093 or .39% skin disease death in

Bangladesh. The age adjusted death rate was 2.96 per 100000 of population ranks #63 in the world.[12]Due to frequent skin damage and itchy sensation for atopic dermatitis increased sleep disturbance, reduces productivity which decreases quality of life in younger patients. The disease causes younger patientssubsequently o disrupt friendships, learning performance, and family relationships, thus negatively influence the overall quality of life in addition to the physical problems. AD has increased in prevalence in many countries in recent decades, but the risk factors for AD in developing countries are unknown[13],[14]Children with AD comprise a heterogeneous group with different disease courses, age at onset, clinical manifestations, severity, duration, and risk of comorbidity.[15,16] Although most children with AD outgrow their disease, it is unclear how many experience persistence of symptoms into adulthood, and little is known about determinants of persistent AD.[17]It is known that parental asthma, allergy, and AD in parents aggravates AD in children and also risk associated with the diseases.Risk is double to the the children whose parents have history of AD.[18]Aswell as concurrent asthma, wheezing,and allergic sensitization in the child.[19,20,21].There are others genetic causes discovered but shown less importance and severity to the physicians. [22] Suspected environmental risk factors for AD development include birth duringwinter,[23] exposure to hard domesticwater, air pollution, low ambient humidity.[24]

II. Methods

A cross-sectional study was conducted based on a review of medical registries in the Department of Dermatology, Bangobondhu Memorial hospital, Chittagong, Bangladesh. Study participants were selected from the Patients who came to hospital for their skin problem from January 2014 to January 2016. The inclusion criteria were age < 5 years, registered diagnosis of Atopic dermatitis.Atopic dermatitis was diagnosed by concerned consultant of the hospital. Demographic history particularly age, sex, birth months, familial background , age of onset, others associated causes with AD, Genetical history of skin diseases and atopic dermatitis were collected . A questionnaire was developed for collecting data from parents. Exclusion criteria was more than 5 years of age and serious and complicated patients with liver and heart diseases. Clinical and physical investigations were recorded for children who admitted in study subject. For conducting the study, study Participants will be examined physically and clinically to follow the guidelines for detecting atopic dermatitis. Topographical distribution of lesions and body surface area were also evaluated Atopic dermatitis was diagnosed by concerned professor/consultant of the hospital during the service time. Age, sex, birth months, Personal& familial past medical recordings or history, age of onset, associated others risk factors were obtained. A questionnaire was developed for collecting data from parents. Exclusion criteria was more than 5 years of age and serious and complicated patients with liver and heart diseases. Clinical and physical investigations were recorded for children who admitted in study subject.

For conducting the study, study Participants will be examined physically and clinically to follow the guidelines for detecting atopic dermatitis. Topographical distribution of lesions and body surface area were also evaluated. All study procedures were performed in accordance with the Ethics Committee of university science and technology, Chittagong, Bangladesh. Study participants and their parents were informed about the study procedures and written informed consent was obtained. Data collection was made during patients administration and further it was input in excel and covert it for STATA 12 for analysis.The X^2 test was used to analyze the results, and $p < 0.05$ was considered statistically significant.

III. Results& Discussion:

9.02% (110 cases) of atopic dermatitis were identified among 1215 children < 5 years seen in the Department of Dermatology, Bangobondhu Memorial Hospital, Chattogram, Bangladesh. From January, 2014 to December, 2016,110 cases were identified (110 cases) 9.02%, where 42.73 %(47) were male and 57.27 %(63) were female. 42 children (38.19%) were aged < 2 years and 68 children (61.82%) were aged > 2 years. The mean age of AD patients was 3.2 years.Moreover, 52.73% (58) children less than 5 years with atopic dermatitis came from rural area and 47.23 %(52) came from urban. Study revealed that in rural context, there were a slight increased prevalence of AD in children than urban area. Distribution of participant's socio demographic characteristics was shown in Table1.

Table 1: Socio demographic characteristics

Characteristics	N	%
Sex		
Male	47	42.73
Female	63	57.27
Age group (years)		
0–2	42	38.18
2–5	68	61.82
Geographical origin		

Urban	52	47.27
Rural	58	52.73

Moreover, among the identified skin diseases, 26.75% seborrhoeic dermatitis, 22.72% contact dermatitis,12.35% Hand eczema ,9.05% atopic dermatitis,8.31% nummular eczema, 7% lichen simplex chronicus ,5.93% foot eczema etc. (Table 2).

Table 2: Frequencies of different types of dermatitis

Types of eczema	Total Number	Total Percentage
Seborrhoeic dermatitis	325	26.75%
Contact dermatitis	276	22.72%
Hand eczema	150	12.35%
Atopic dermatitis	110	9.05%
Nummular eczema	101	8.31%
Lichen Simplex Chronicus	85	7.00%
Foot eczema	72	5.93%
Scabies e eczematization	45	3.70%
Scrotal dermatitis	32	2.63%
Nipple eczema	11	0.91%
Others	8	0.66%

Children had the highest risk of atopic dermatitis (38.18% and 20% of cases) during winter season (January & February) and Spring (March –April).The correlation between the Bangla seasons and AD prevalence during visited in the hospital was shown in Table 3 ($p = .005$) during sit/ winter and spring (from January to April) ($p = 0.005$). Moreover, 12.73% of cases in Summer,10.91 % of cases in Moonson,8.18% of cases in autumn and 10% of cases in late autumn.

Table 3: Seasonal effect of Atopic dermatitis.

Seasons (Bangla)	**English Month**	**Total (N)**	**Percentage**	**Bengali Months**	**P Value**
Bosonto (Spring)	March-April	22	20.00	Falgun, Choitro	.005%
Grishmo (Summer)	May-June	14	12.73	Boishakh, Joishtho	
Borsha (Monsoon)	July-August	12	10.91	Asharh, Srabon	
Shorot (Autumn/ Fall)	August-October	9	8.18	Bhadro, Ashwin	
Hemonto (Frost/ Late Autumn)	November-December	11	10.00	Kartik, Ogrohayon	
Sit(Winter)	January- February	42	38.18	Poush, Magh	.005%

Table 4 considers children personal history with some other skin diseases. We have identified that 24.55% of allergic rhinitis and 14.55% of Atopic dermatitis in the family which have a co relation between family history with AD and children with AD.

Table 4 : Personal history related to Skin diseases		
Allergic rhinitis	27	24.55
Food allergy	14	12.73
Drug allergy	6	5.45
Atopic dermatitis	16	14.55
Asthma	12	10.91
Allergic conjonctivitis	7	6.36

Topographic distribution among less than 2 years and 2-5 years were described in the table 5. We have seen that most of the children had high level of risk for AD in convex area of the faces.

Table 5: Topographic distribution

Topographical distribution of Atopic dermatitis in children	Children < 2 yearsn(%)	Children 2-5 years	p value
Convex areas of the face	14	20	0.014
Extensor surface of upper limb	10	16	0.45
Lower limb	8	13	0.9
Skin folds (neck, large flexures of the elbows and knees)	6	11	0.27
Scalp	4	8	0.03

The study had clinical and physical presentation for identification of AD, where 78% of the children had acute lesion (Papulovesicular lesions) and 8.6% of the children had impetiginized lesion, 6.60% have lichenification.

Table 6: Clinical & Body surface area

Clinical presentation		
Acute lesions (papulovesicular lesions)	73	78.10
Impetiginized lesion	10	8.60
Lichenification	7	6.60

Table shows the hereditary, environmental exposure and water sources factors association. Here children with AD have their maternal asthma 32.73% (36) ,Maternal AD 20.91% (23) ,maternal Allergic rhinitis 19.09%(21), Parental asthma 8.18%,parental AD was 10% ,Parental Allergic rhinitis was 9.09%. In case of environmental exposure, 9.09% children with AD had their mothers with Sexually transmitted diseases, 16.36% had their mother with depression, 11.82 % of the children with had their mother during pregnancy used antibiotic.

Table 7: Factors associated with hereditary, environmental exposure and water sources.

Characteristices	Atopic Dermatitis (AD),n=110	Percentage	P Value
Hereditary			
Maternal Asthma	36	32.73	NA
Paternal Asthama	9	8.18	
Maternal AD	23	20.91	0.18
Maternal Allergic rhinitis	21	19.09	0.93
Paternal AD	11	10.00	<.001
Paternal Allergic rhinitis	10	9.09	<.001
Environmental exposure		0	
STD with mothers	10	9.09	0.85
Mothers with depression	18	16.36	0.18
Any smoking during pregnancy	0	0	0
Any antibiotic during pregnancy	13	11.82	0.96
Any supplementation during pregnancy	22	20	0.78
Sources of Water		**0**	
Pipe water	57	51.82	0.67
Tubewell	44	40	0.49
River	2	1.82	<.001
Ponds	3	2.73	<.001
Others	4	3.64	<.001

20% of the children during their birth, mother had taken supplementation. For Use of water sources, 57% of the children and their family used piped water ,40% tube well, 2.73 % ponds and others 3.64 had others sources.

We have identified others studies that 50% of AD starts in the first year of life and 85% starts by age 5 years. [25],[26],[27]Atopic dermatitis is one of the most inflammatory skin disease observed among children now a day with increasing prevalence in the world 5–20 % [28]. However, studies on the prevalence and associated risk factor of AD among children are very few in our country except a few studies conducted. Determining country specific magnitude and Identifying factors related to AD is crucial to halt the occurrence, recurrence and complication of AD by strengthening the national skin diseases prevention and control program.

IV. Conclusion:

The study has suggested a few things that children particularly affected in winter season and also children whose mother have some sorts of skin diseases, asthma are also vulnerable and chance to affect their overall life. It is also considers that Atopic dermatitis is one of the skin disease which hampers the children's life vulnerable.

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