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Original Article

Atopic dermatitis: frequency of associated disorders in children

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Abstract

Background Atopic dermatitis is a chronic inflammatory disease of multifactorial origin. It is the most common type of childhood eczema seen in our community. Most of these patients have a positive family or personal history of atopy in the form of asthma, allergic rhinitis or hay fever. Multiple dermatological disorders are associated with the atopic dermatitis.

Objective The study was aimed to see the frequency of these associations in children with atopic dermatitis in our community and to compare these results with international literature.

Patients and methods The study was carried out in the department of dermatology, "Ziauddin Medical University, KDLB Campus" from 1st September 2003 to 31st August 2004. All the freshly registered patients up to 15 years of age suffering from atopic dermatitis were enrolled in the study. The clinical diagnosis was made on the basis of diagnostic criteria for atopic dermatitis described by UK's working party. All the findings were recorded on a preformed pro forma and relevant investigations carried out. Results were compiled and tabulated.

Results The family history of atopy was positive in 78 patients (68.4%) while the personal history of atopy in 48 (42.1%). Irritant contact reactions were commonly observed in 52 patients (45.6%). Dry and cold weather exacerbated the disease in 85 patients (74.5%) while 3 patients (2.6%) suffered aggravation in summer. Among endogenous eczemas discoid eczema was seen in 27 patients (30.8%), pityriasis alba in 21 (18.4%), and seborrheic dermatitis in 10 patients (8.8%). The most common infections were bacterial, seen in 12 patients (10.5%) followed by viral and fungal infections seen in 9 (7.8%) and 4 patients (3.5%), respectively. Nail changes like pitting, ridging, thickening and discoloration were seen in 7 patients (6.1%). Other findings observed in our patients were Dennie-Morgan fold in 4 patients (3.5%) and cataract in 5 patients (4.5%).

Conclusion Atopic dermatitis is associated with multiple conditions. A high percentage of patients have a positive family or personal history of atopy. Environmental factors like weather, irritants and infections cause worsening of the disease. Atopic patients have an increased frequency of other endogenous eczemas and nail and eye changes.

Key words
Atopy, endogenous eczema, Dennie-Morgan fold, infections

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Introduction

Atopic dermatitis (AD) is a common chronic inflammatory disease of multifactorial origin resulting due to an interplay of endogenous

and exogenous factors in genetically predisposed individuals.[1,2] It is the most common type of childhood eczema seen in our community.[3] This disease may result in psychological, social and functional disability to children and their families. Atopic dermatitis is well known to be associated with different clinical conditions. Most of these patients have a positive family or personal history of atopy in the form of asthma, allergic rhinitis or hay fever. Among the dermatological disorders, all the endogenous eczemas are more likely to occur in these subjects e.g. seborrheic dermatitis, pityriasis alba and juvenile plantar dermatosis. Irritant and allergic contact dermatitis is also increasingly reported in these patients.[4] A raised serum level of IgE and peripheral eosinophilia is a common association. Various infections i.e. bacterial, viral and fungal have a higher incidence in atopics as compared to normal subjects. Keratosis pilaris and various eye changes are other well known associations of atopic state. The other important associations include drug reactions, reactions to insect bites, food allergies and alopecia areata. Physical growth may be retarded in some patients. Genetically determined conditions like ichthyosis vulgaris, Netherton's syndrome, Down's syndrome and several immunodeficiency syndromes are rare associations.

Studies have been conducted world wide to see the frequency of all these associations. The current study was carried out in the department of dermatology, Ziauddin Medical University, KDLB Campus from 1st September 2003 to 31st August 2004. The study was aimed to see the frequency of these associations in children with atopic dermatitis in our community and to compare the results with international literature.

Patients and methods

All the freshly registered patients up to 15 years of age suffering from atopic dermatitis were enrolled in the study. The clinical diagnosis was made on the basis of diagnostic criteria for atopic dermatitis described by UK's working party.[5,6,7] Patients were included irrespective of the severity of the disease. Patients belonged to both sexes. All the patients were divided into three groups according to their ages i.e. infancy, 1-5 years and 6-15 years. After a detailed history, complete general, systemic and cutaneous examination was carried out. All the findings were recorded on a preformed pro forma. In addition to the routine investigations, any relevant investigations when required were also carried out. These included scrapings for fungus, swabs for culture and sensitivity, patch test and biopsy for histopathology.

Results

A total of 114 patients were enrolled in the study, comprising 63 males (55.3%) and 51 females (44.7%). The minimum age of presentation was 2 months and maximum 15 years. Mean age was 8.8 years. **Table 1** reveals the age wise breakup of these patients. **Table 2** reveals the sites of involvement in these patients. The family history of atopy was positive in 78 patients (68.4%) while the personal history of atopy in 48 patients (42.1%). The relative frequencies of atopic diseases in these patients were, asthma 10% and allergic rhinitis 12%. Drug reactions were seen in 4

patients (3.6%). Irritant reactions to common irritants like soaps, detergents, hot water and synthetic clothing were a feature in 52 patients (45.6%). Eighty five patients (74.5%) complained of worsening of their disease in winter season while 3 patients (2.6%) suffered aggravation in summer. In the remaining 26 patients (22.8%) there were no seasonal variations. **Table 3** shows the relative frequencies of various endogenous eczemas in our patients. **Table 4** shows various infections observed in our patients. The breakup of bacterial infections was impetigo 5 patients (4.4%), ecthyma 2 patients (1.8%) and furuncles 1 patient (0.9%).The descending frequency of viral infections was, molluscum contagiosum in 6 patients (5.4%), chicken pox in 2 patients (1.8%) and viral warts in 1 patient (0.9%). Among fungal infections there were 3 patients (2.6%) suffering from tinea capitis and 1 patient (0.9%) had tinea faciei. White dermographism was a feature in 12 patients (10.5%). The eye lashes were partially lost in 4 patients (3.5%) while Dannie-Morgan fold was seen in a similar number of patients. Cataract was a feature in 5 patients (4.5%). Nail changes in the form of pitting, ridging, thickening and discoloration were a feature in 7 patients (6.1%). Of the genetically determined associations keratosis pilaris was present in 5 patients (4.5%) and ichthyosis vulgaris in 4 patients (3.5%). Alopecia areata was observed in 2 patients (1.8%).

Table 1 Age and sex wise distribution (n = 114)

Age group	*Male*	*Female*	*Total (%)*
Infancy	28	26	54 (47.3)
1-5years	17	14	31 (27.2)
6-15 yrs	18	11	24 (25.4)

Table 2 Sites of involvement (n=114)

Sites	*%*
Legs	44
Face	42
Arms	40
Popliteal fossae	40
Cubital fossae	38
Napkin area	20
Neck	16
Scalp	6
Trunk	4

Table 3 Frequencies of endogenous eczemas (n=114)

Type of eczema	*n (%)*
Discoid eczema	27 (30.8)
Pityriasis alba	21 (18.4)
Seborrheic dermatitis	10 (8.8)
Xerotic eczema	8 (9)
Lichen simplex chronicus	2 (1.8%)
Juvenile plantar dermatosis	1 (0.9%)

Table 4 Infections (n=114)

Infection	*n (%)*
Bacterial	12 (10.5%)
Viral	9 (7.8%)
Fungal	4 (3.5%)

Discussion

AD is a chronic relapsing skin disorder triggered by genetic, immunologic and environmental factors.[2,8] It affects people of all age groups but mostly presents in infancy. Seventy-five percent of individuals experience marked improvement in the severity of atopic dermatitis by the age 10-14 years, but remaining 25% continue to have relapses during their adult life. The disease is well known to be associated with multiple other diseases. Along with asthma and allergic rhinitis, atopic dermatitis is part of a larger family of allergic diseases.[9] In our study, family history of atopy was positive in 78 patients (68.4%), 12% had allergic rhinitis and 10% asthma**.** Moremo *et al*.[10] and Mortz *et al*.[11] reported similar frequency of atopic disorders in their studies.

Skin irritants particularly detergents, wool, synthetic fabrics, solvents, and perspiration may also exacerbate atopic dermatitis. In addition, anything that promotes drying of the skin (e.g. alcohol or astringents in toiletries, prolonged bathing, swimming, low humidity) should be minimized. In the current study, we found irritant reactions in 52 patients (45.6%). The association of irritant reaction in our study is consistent with reports in literature.[12] Cold and dry weather exacerbated the disease symptoms in 85 patients (74.5%) while 3 patients (2.6%) complained of aggravation in summer. Rajka[13] has shown similar association of weather with atopic state.

Increased frequency of different endogenous eczemas has been reported in atopic subjects. In our study 27 patients (30.8%) had discoid eczema, 21 patients (18.4%) developed pityriasis alba while seborrheic dermatitis was a feature in 10 patients (8.8%). Other endogenous eczemas observed in our patients were xerotic eczema in 8 patients (9%), lichen simplex chronicus 2 (1.8%) and juvenile plantar dermatosis in 1 patient (0.9%). Podmore *et al*.[14] also observed seborrheic dermatitis-like picture in many atopic children.

Microbiological infections are considered to be of pathophysiological importance in atopic dermatitis. A deficiency in the expression of antimicrobial peptides may account for the susceptibility of patients with atopic dermatitis to skin infection with *S. aureus*.[15] Ahmed *et al*.[16] has also shown a high frequency of staphylococcal colonization in atopic children. A number of different widespread and disseminated viral infections can occur in patients with atopic dermatitis.[17,18,19] The study also revealed a high frequency of bacterial, viral and fungal infections in our patients with a descending frequency of 10.5%, 7.8% and 3.5%, respectively.

White dermographism was seen in 12 patients (10.5%). Wong *et al.*[20] have reported a high frequency of this change in their study.

Eye changes were observed commonly in this study. Eye lashes were lost in 4 patients (3.5%) while Dennie-Morgan fold was seen in similar number of patients. The infraorbital fold is reported in many studies world over.[21,22] Conjunctivitis was a feature in 5 patients (4.5%). Christensen[23] found conjunctivitis in 6% and Amemiya *et al*.[24] observed this feature in 31.8% of their patients. Nail changes in the form of pitting, ridging, thickening and discolouration were a feature in 7 patients (6.1%).

Keratosis pilaris is well known to be associated with atopic dermatitis. The change was seen in 5 patients (4.5%) in this study. Ichthyosis vulgaris was a feature in 4 patients (3.5%) and alopecia areata in 2 patients (1.8%).

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