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Original Research Article

Evaluation of Clinical Diagnostic Criteria of Atopic Dermatitis and Serum IgE Levels in Patients with Chronic Eczema

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ABSTRACT

Introduction: Eczema is an inflammatory skin reaction which presents as acute, sub acute and chronic forms. Atopic dermatitis (AD) is a type of chronic or chronically relapsing eczematous skin disorder. In this study, we aimed to determine the percentage of AD in patients of chronic eczema by using Hanifin and Rajka criteria (HRC), estimate serum IgE levels and determine its correlation with chronic eczemas and clinical parameters of HRC.

Materials and Methods: A total of 50 patients with chronic eczema meeting defined inclusion and exclusion criteria were enrolled in this study after taking informed consent. Patients were examined for major and minor clinical parameters for AD using HRC and were tested for absolute eosinophil count (AEC) and total serum IgE levels.

Results: AD was present in 34% of chronic eczema patients. Serum IgE level was raised in 58% of chronic eczema and 68.7% of AD patients. Increased AEC level was seen in 75.86% patients. Raised serum IgE levels showed a specific association with 3 parameters of HRC, typical morphology and distribution of lesions, early age of onset and perifollicular accentuation.

Conclusion: AD (64%) was the commonest cause for chronic eczema. Pruritus, xerosis, elevated serum IgE and AEC levels, and non-specific hand and/or foot dermatitis showed significant association with AD. Serum IgE levels was raised in 58% of chronic eczema patients and showed significant association with typical morphology& distribution of lesions, early age of onset and perifollicular accentuation. Hertoghe's sign was observed in 26% of chronic eczema and 28.1% of AD patients. Brown body hair was present in 21.8% of AD patients. This was an observation made solely in this study and has not been defined in any of the previous studies.

Key words: Atopic dermatitis (AD), Serum IgE levels, AEC, HRC (Hanifin and Rajka criteria).

INTRODUCTION

Eczema is an inflammatory skin reaction characterized by variable intensity of itching, papules, vesiculation, exudation, scaling, lichenification and histologically by spongiosis, acanthosis, hyperkeratosis and lymphohistiocytic infiltrate in the dermis. Clinically it is categorized as acute, subacute and chronic. [1] Eczema persisting for more than 6 weeks or characterized by thickening and discolouration of skin is typical of chronic eczema.

Atopic dermatitis (AD) is an itchy, chronic, or chronically relapsing eczema characterized by papules which become excoriated and lichenified and typically have a flexural distribution. [2] Among all types of eczemas, AD has been noted in 0.7% of patients. [3] In India, cases with

minor forms of atopic dermatitis predominate than classical cases.

There have been many studies on prevalence of AD in general population but none in patients with chronic eczemas. Assessing patients with all forms of chronic eczema for atopic dermatitis helps us to understand the role of AD in clinical presentation and course of chronic eczema.

MATERIALS AND METHODS

This cross-sectional observational study was conducted in Department of Dermatology, Venereology and Leprosy at Adichunchanagiri Hospital and Research Centre, B.G. Nagara, Karnataka on an out-patient basis, from November 2009 to May 2011 for a total period of 18 months. Patients willing for the study, patients with eczematous skin lesions of > 6 weeks duration, presence of past history of similar lesions or signs of lichen simplex chronicus were included. Patients with an immune-compromised status, pregnant/ lactating women and patients with other systemic diseases or on systemic corticosteroids and immune suppressants are excluded.

Procedure of the Study: A total of 50 patients with chronic eczema were enrolled in this study after taking an informed consent. In cases of minors, the informed consent of parents or guardians was taken.

All patients were subjected to a detailed history and clinical examination based on a prepared proforma regarding duration of present illness, age of onset, exacerbating factors, and personal and family history of atopic disorders, and documentation of distribution and morphology of lesions. On this background, clinical diagnosis of different types of eczemas was made.

A thorough clinical examination was carried out to determine all major and minor clinical parameters of Hanifin and Rajka's criteria for AD. Patients were examined for other associated clinical features which are not part of HRC and its frequency noted. A diagnosis of AD was confirmed on the basis of HRC wherein a set of three major and three minor criteria should be present.

Hertoghe's sign and brown body hair which are not part of the HRC were also screened in these patients.

Blood samples were collected from all enrolled patients for AEC (which is not part of HRC) and total serum IgE levels. Total serum IgE level less than 200 IU/ml was considered as normal. AEC was also performed manually for all patients by using Fuchs Rosenthal chamber and values below 350 cells/ mm^3 were considered normal. Results of investigations were reviewed in both chronic eczema and AD patients.

After screening all the enrolled patients of chronic eczema, the percentage of patients satisfying HRC, i.e., diagnosed as AD was calculated. Most common forms of chronic eczemas associated with AD were noted.

The frequencies of all the clinical parameters of HRC were calculated. Commonly occurring clinical parameters of HRC associated with elevated serum IgE levels was also noted. Statistical analysis like descriptives, frequencies and chi-square test were done.

RESULTS

Out of 50 patients enrolled for the study, before evaluating HRC, there were 32 females and 18 males with age ranging from 5-80 years (mean 42.04 years). Majority of the males were farmers and majority of females were housewives assisting in agriculture.

Chronic eczemas was found to be due to clinically diagnosed AD (34%), lichen simplex chronicus (16%), chronic hand and/or foot eczema (16%), airborne contact dermatitis (10%), phytophotodermatitis (10%), chronic actinic dermatitis (8%), polymorphic light eruptions (4%), and seborrhoeic dermatitis

(2%) in this study. History of plant allergy was the most significant exacerbating factor of AD. Seasonal variation was observed in 54% and flexural distribution in 70% of patients with chronic eczema.

After evaluating HRC, 32 (64%) out of 50 patients, with chronic eczema satisfied Hanifin and Rajka criteria for AD, which was statistically significant (P= 0.048). Only 13 patients (82%) of 16 clinically diagnosed AD patients satisfied Hanifin and Rajka's criteria for AD. Hanifin and Rajka's criteria were satisfied by all patients presenting with air borne contact dermatitis. Pruritus and chronically relapsing course was observed in all patients with chronic eczema.

Among the minor criteria of Hanifin and Rajka, xerosis, raised serum IgE levels (P=0.034) and non-specific hand and/or foot dermatitis showed a statistically significant association with AD.

Serum IgE levels were raised in 58% of chronic eczema patients and 68.7% of AD patients. Raised serum IgE levels showed a specific association with 3 parameters of HRC, typical morphology and distribution of lesions, early age of onset and perifollicular accentuation.

AEC was raised in 74% of chronic eczema and 75% of AD patients.

Hertoghe's sign was present in 26% and 28.1% of chronic eczema and AD patients respectively.

Brown body hair was present in 18% and 21.8% of chronic eczema and AD patients respectively.

	Evaluation of Hanifin and Rajka Diagnostic Criteria for chronic eczema and Atopic Dermatitis (AD)				
Major Criteria		Chronic eczema (n-50)		AD (n=32)	
		No.of patients	%	No.of patients	%
1	Pruritus	49	98	32	100
2	Typical morphology and distribution	37	74	31	96.8
3	Chronic or chronically relapsing course	50	100	32	100
4	Personal and/or family history	24	48	24	75

Minor criteria		**Chronic eczema**		**AD**	
		No.of patients	**%**	**No.of patients**	**%**
1	Xerosis	48	96	30	93.75
2	Orbital darkening	19	38	15	46.8
3	Hyperlinearity of palms	19	38	13	40.6
4	Early age of onset	14	28	9	28.1
5	Raised serum IgE	29	58	22	68.75
6	Tendency towards cutaneous infection	7	14	3	9.3
7	Facial pallor	4	8	3	9.4
8	Anterior neck folds	2	4	1	3.1
9	Intolerance to wool	4	8	4	12.5
10	Food intolerance	6	12	5	15.6
11	Nipple eczema	3	6	2	6.25
12	Chelitis	12	24	9	28.1
13	Cataract	13	26	9	28.1
14	DM fold	13	16	6	18.75
15	Recurrent conjunctivitis	21	42	17	53.1
16	Non-specific hand hand and/or foot eczema	34	68.75	22	68.75
17	Pityriasis alba	7	14	5	15.6
18	Itch when sweating	16	32	14	43.75
19	Perifollicular accentuation	16	32	14	43.75
20	Course influenced by environmental and emotional factors	21	42	17	53.1

DISCUSSION

Eczema is a clinical and histological pattern of inflammation of the skin seen in a variety of dermatoses with widely diverse etiologies. AD is a chronic relapsing eczematous condition with varied manifestations. The diagnosis depends on clinical features as there are no

definitive diagnostic tests. HRC has been considered as a gold standard for diagnosis of AD since its inception in 1980. Patients with atopy or atopic dermatitis are more prone for all types of eczemas. [4-6] Hence, we took up this study to evaluate occurrence of atopic dermatitis and its various diagnostic clinical parameters in all patients with chronic eczemas. There are no studies reported on this issue and hence, we have compared our results with few related studies published in world literature.

Age distribution of most of the patients (28%) belonged to 41-60 years age group (Mean 42.04 years). There was equal distribution of patients in all other age groups. Females (64%) clearly outnumbered males (36%) and the result was statistically significant (P= <0.028). Among all the eczema patients, 36% were farmers and an equal number of patients were housewives with an agricultural background. The results showed that environmental factors play a major role in acute exacerbation of chronically relapsing dermatitis. In our cohort, farmers were predominately affected implying exposure to dust, pollens, chemicals and other allergens as causative or precipitating factor for chronic eczema.

Chronic eczemas were found to be due to clinically diagnosed AD (34%), chronic actinic dermatitis (8%), airborne contact dermatitis (10%), lichen simplex chronicus (16%), polymorphic light eruption (4%), phytophotodermatitis (10%), chronic hand and/or foot eczema (16%) and seborrheic dermatitis (2%) in our study. However, these findings could not be compared with any earlier studies due to paucity of similar reports.

Chronic eczema can be both localized and generalized depending on the severity of condition. The site of involvement depends upon the inciting factors. In this study, distribution of skin lesions were categorized broadly into 9 headings, flexures (70%), extensors (60%), face (60%), seborrhoeic areas (32%), feet (32%), hands (30%), trunk (30%), nipples (6%) and generalized (12%).

Among AD patients, distribution of lesions was in flexures (84.3%), extensors (65.6%), face (65.6), seborrheic areas (37.5%), trunk (34.3%), feet (28.1), nipples (6.25%) and generalized (9.3%). The increased flexural distribution noticed in our study could be attributed to the mean higher age of the patients in our study (42.04 years) in contrast to study by Dhar et al and Yazganoglu et al. [7,8]

It is well known that flexures are predilection sites of AD in adults. Extensor distribution in current study is high in contrast to both the previous studies [8] which could be due to the fact that AD individuals are more susceptible to develop various exogenous eczemas for example photodermatitis which tend to involve extensor surfaces or photoexposed areas.

Among the major criteria's in HRC, Pruritus was present in all the patients who were diagnosed as AD and 98% in the patients with chronic eczema. Pruritus was mostly generalized irrespective of distribution and increased in intensity during the night. Distribution of flexural lichenification or palmar linearity in adults, and facial and extensor involvements in infants and children was present in 74% of patients.

Chronic or chronically relapsing dermatitis which was one of the inclusion criteria, was regarded as any eczema persisting for more than 6 weeks or more, or having history of similar episode in past was present in 100% of patients recruited in this study. Yazganganoglu et al also observed a frequency of 100% in 320 patients of AD. [8] Atopy in general term means a tendency to develop allergic manifestations. We defined Atopy as the existence of one or more parameters in past or present or recurrent or previously diagnosed as asthma ± eczema ± allergic rhino-conjunctivitis. In this study, above

parameters was present in 24% of patient's family members. Similarly, 75% patients diagnosed as AD had either one of these features of atopy, allergic rhinitis (62.5%), bronchial asthma (25%) and conjunctivitis (20%)

Xerosis is commonly present in AD. Hiletework [9] proposed xerosis to be included as major criteria as it has shown to have a very strong association with AD, which is similarly seen in current study. Hyperlinearity of palms was seen in high frequency in current study in contrast to previous studies. [10] It could be due to secondary hyperlinearity that is a result of cumulative contact irritant dermatitis seen commonly in agriculturists. Wool intolerance was found only in 8% of patients who satisfied HRC. This suggests that there is decrease in sensitivity to wool fibre with advancing age. The common foods to which patients could relate their condition were non-vegetarian foods like mutton and pork.

An incidence of hand and foot eczema was higher than previous results [10] as majority of patients in our study were of agricultural background where there is constant insult to hands and feet. Pityriasis alba was seen mostly in children between 3-16 years of age and results were comparable to previous studies. [7, 11]

A correlation between elevated serum IgE antibodies and various clinical parameters of HRC was evaluated by means of contingency coefficient test to know which parameters are associated in patients having raised serum IgE levels. Typical morphology and distribution of lesions (P= 0.031), early age of onset (P= 0.021) and perifollicular accentuation (P=0.035) were the only parameters which showed statistically significant association with elevated serum IgE levels.

Hertoghe's sign was observed in 26% of chronic eczema and 28.1% of AD patients. Brown body hair was present in 21.8% of AD patients. This was an observation made solely in this study and has not been defined in any of the previous studies. However, more studies are required with controls to assess the association of brown body hair with AD. All the other minor criteria were almost consistent with the previous reports associated with AD.

AEC (Absolute eosinophil count) raise was seen in 74% (p=37) patients of chronic eczema ranging from 174 to 1050 cells/mm3 with mean ± SD of 481.28±201.59. In patients of AD, 75% (p=24) had raised serum AEC levels ranging from 200 to 896cells/mm3 and a mean±SD of 494±198.36 which was comparable to other studies [12]

CONCLUSION

Chronic eczema predominately involved females and middle aged persons. It presented flexurally in most patients. Atopic dermatitis (64%) was the commonest cause of chronic eczema implying a strong association between chronic eczema and atopic diathesis. Pruritus, xerosis, elevated serum IgE and AEC levels and specific hand and/or foot dermatitis showed a statistically significant association with atopic dermatitis in patients with chronic eczema. Agricultural occupation was a confounding factor for the very high frequency of hyper-linearity of palms observed in the study.

Serum IgE levels were raised in majority (58%) of chronic eczema irrespective of those satisfying Hanifin and Rajka's criteria for atopic dermatitis. Among the various parameters of Hanifin and Rajka, typical morphology and distribution of lesions, early age onset and perifollicular accentuation showed statistically significant association with raised serum IgE levels. AEC, Hertoghe's sign and brown body hair which are not part of HRC, but showed significant association with both chronic eczema and AD, and can be included as part of the minor criteria of HRC.

Hence, by this study, we aim to assess the prevalence of AD and its various diagnostic parameters in patients presenting with all forms of chronic eczema. With this evidence, guidelines for occupational and life-style counselling can be given to the patients with past or present history of atopic dermatitis which will help in reducing recurrence of the disease and improve quality of life.

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