International Journal of Community Medicine and Public Health
Bahuguna A et al. Int J Community Med Public Health. 2021 Jan;8(1):161-166
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20205687

Original Research Article

Evaluation of the role of patch test in endogenous eczemas

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Received: 08 December 2020
Revised: 11 December 2020
Accepted: 14 December 2020

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ABSTRACT

Background: Endogenous eczemas have a significant effect on quality of life of patients and is a huge burden on healthcare. There is evidence that external factors play an important role in endogenous eczemas. The study was conducted to evaluate the role of patch test in endogenous eczemas and to identify any causal or aggravating allergen, the avoidance of which could augment response to standard therapy and prevent relapse.
Methods: Four groups of 27 patients each, with clinical diagnosis of one of the major endogenous eczema namely, Atopic dermatitis, nummular eczema, pompholyx and seborrhoeic dermatitis satisfying the inclusion and exclusion criteria were included in the study. Demographic and clinical details were recorded and were patch tested with the Indian standard patch test battery. Dermatology life quality index (DLQI or children's DLQI) was used at the presentation and after 03 months to assist in assessing the subjective improvement after avoidance of the agents incriminated by the patch test.
Results: Of the 108 study participants, 61 (56.5%) patients had one or more positive results in the study, with maximum 21 (77.8%) in pompholyx and minimum of only 10 (37%) in patients of seborrhoeic dermatitis group. About, 36 (33.3%) patients had no change and 05 (4.6%) had worsening of their eczema.
Conclusions: We found positive outcome in the form of clinical improvement or cure following the avoidance of allergens implicated by patch testing. This study recommends inclusion of patch test in the management protocol of endogenous eczemas.

Keywords: Endogenous eczema, Patch test, Dermatology life quality index

INTRODUCTION

Eczema is a disease group or genus that encompasses a number of forms of dermatitis, both endogenous and exogenous. The term endogenous eczema implies that the eczematous condition is not due to exogenous or external environmental factors, but is mediated by processes originating within the body. In some conditions, however, there are both external and internal precipitating factors. Prevalence estimates are as high as one-third of the population, depending on the country studied, the age range of the subjects, and the diagnostic criteria used.[1]

It has been shown that atopic develop a significant degree of contact allergy sensitization detectable by patch test.[2,3] Patch testing is also recommended in patients suffering from various types of eczematous conditions, which are considered endogenous in origin either partly or entirely. The rationality behind the strategy lies on the fact that in many cases allergic contact dermatitis may worsen the original underlying dermatitis.[4] Many recent studies have concluded that patch testing should be considered for all patients with severe or persistent discoid eczema because allergic contact dermatitis may be relatively common in such patients and the avoidance of offending allergens

may be of substantial benefit to the patients.[5] The exact etiology of pompholyx remains obscure, although many studies have linked atopy, primary irritants and even allergens.[6]

Determining any causal or aggravating factor can save the patient from the agony of persistent discomfort and restricted social life thereby considerably improving the dermatology-specific quality of life. Patch test has been a proven modality for investigating exogenous eczemas but their role in endogenous eczemas, though promising has not been investigated much and overall they still remain an underused investigation.[7,8]

There is paucity of studies on endogenous eczemas, especially in Indian context. Hence this study was undertaken to determine the role of patch test in incriminating aggravating factors in the major endogenous eczemas and also whether the avoidance of the same augments the response to standard therapy and prevent relapse. The patch test readings were done according to ICDRG criteria.[9]

Since the patients with atopic dermatitis are less prone to type IV allergies, there has been controversy regarding the role of patch testing in these patients. Patients with atopic dermatitis should be patch tested when indicated because they also develop contact allergic sensitization to a significant degree.[10] Observations indicate that patch testing with standard allergens often adds valuable information about contact sensitivity in these patients.[3]

Although the cause is unknown, many factors, acting alone or in combination, have been noted in patients and have been proposed as etiologic agents. Bacteria have been incriminated both as a direct cause and through the mechanism of hypersensitivity. Although *Staphylococci* and *Micrococci* may be present in the eczematous lesions, their pathogenic role remains unresolved. Some authors have found a high incidence of atopy, but others have not and the levels of IgE are within normal range.[11]

Many studies aimed at evaluating secondary contact dermatitis in patients with nummular dermatitis have used patch test and concluded that patch testing has the potential to improve the quality of life in these patients.[12] Specific allergy may be overlooked in chronic cases and therefore patch test is recommended in all cases of chronic recalcitrant nummular dermatitis.[13]

In a retrospective study of patch testing in patients of nummular eczema, conducted in UK, it was suggested that allergic contact dermatitis is relatively common in persistent discoid eczema, and allergen avoidance may be of benefit. Thus the study recommended that, patch testing should be considered for all patients with severe or persistent discoid eczema.[14]

METHODS

A prospective study was carried out at a tertiary care center in Western Maharashtra with follow up of patients to evaluate the effect of avoidance of the agents incriminated by patch test.

Study period

A minimum period of 03 months from September 2019 to February 2020.

From outpatient department, stratified random sampling was done and 27 consecutive patients each with clinical diagnosis of atopic dermatitis, nummular eczema, pompholyx and seborrhoeic dermatitis within the age bracket of 5-60 years and satisfying the inclusion and exclusion criteria were included in the study.

Inclusion criteria

Patients with the clinical diagnosis of atopic dermatitis, nummular eczema, pompholyx and seborrhoeic dermatitis with minimum 02 weeks wash-out period for steroids, anti-histaminic and other immunosuppressive drugs.

Exclusion criteria

Patients with comorbidities, active lesion over the back, history of known allergy/anaphylaxis, pregnant and lactating women.

Detailed history with emphasis on features suggesting atopy and relieving and exacerbating factors was recorded. A thorough general physical, systemic and dermatological examination was done and patients were patch tested with the Indian standard patch test battery approved by the contact and occupational dermatosis forum of India (CODFI).

Dermatology life quality index (DLQI or children dermatology life quality index CDLQI) was used at initial evaluation and at 3rd month of follow up for evaluating subjective improvement.

Statistical analysis

Descriptive statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean ± SD (min-max) and results on categorical measurements are presented in number (%). 2x4 Fisher exact test has been used to find the significance of study parameters on categorical scale between two groups. The data was analyzed using SPSS software version 23. P value<0.05 was considered statistically significant.

RESULTS

The study participants (n=108) comprised 67 (62%) males and 41 (38%) females. Sex distribution of each eczema group is given in Figure 1. The mean age of participants was 29.37±16.32 years (range 05 to 60 years) and distribution as per eczema group is given in Table 1.

Amongst the patients, 85 (79%) belonged to urban area whereas remaining were from rural area. Students comprised the maximum study participants of 40 (37%), followed by 32 (29.6%) laborers and least being those who were unemployed 03 (2.8%). Distribution as per occupation is given in Table 2.

The mean duration of symptoms was 4.6 years for atopic dermatitis, 2.4 years for nummular dermatitis, 2 years for pompholyx and 2.6 years for seborrhoeic dermatitis distribution of which is given as per Table 3.

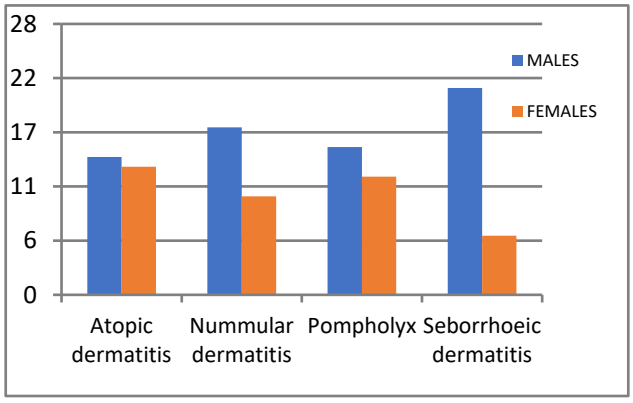

Figure 1: Sex distribution for each eczema group.

Table 1: Age distribution of each eczema group.

Age (years)	Atopic dermatitis		Nummular eczema		Pompholyx		Seborrhoeic dermatitis		All patients	
	N	%	N	%	N	%	N	%	N	%
1-10	14	51.9	2	7.4	1	3.7	0	0.0	17	15.7
11-20	9	33.3	1	3.7	11	40.7	2	7.4	23	21.3
21-30	2	7.4	1	3.7	8	29.6	4	14.8	15	13.9
31-40	2	7.4	3	11.1	4	14.8	10	37.0	19	17.6
41-50	0	0.0	12	44.4	2	7.4	7	25.9	21	19.4
51-60	0	0.0	8	29.6	1	3.7	4	14.8	13	12.0
Total	27	100.0	27	100.0	27	100.0	27	100.0	108	100.0
Mean±SD	12.44±8.26		42.00±14.75		24.48±10.96		38.56±11.44		29.37±16.32	

Table 2: Distribution of study participants as per occupation.

Occupation	Number (%)
Students	40 (37)
Laborers	32 (29.6)
Housewives	19 (17.6)
Farmers	5 (4.6)
Security guards	4 (3.7)
Clerks	5 (4.6)
Unemployed	3 (2.8)

In cases of atopic dermatitis, 14 patients (51.9%) were positive for one or more allergen and most common allergens were fragrance mix (22.2%) and nickel sulphate (14.8%). For nummular eczema, 16 patients (59.3 %) were positive for one or more allergen, most common allergens being nickel and cobalt 14.8% each and fragrance mix and neomycin 11.1% each. For pompholyx, 21 patients (77.8% %) were positive for one or more allergen with most common allergens being nickel (40.7%), cobalt (29.6%), fragrance mix and neomycin sulphate 11.1% each. Patch test results were least positive in seborrheic dermatitis wherein 10 patients (37%) were positive for one or more allergen and most common allergens were nickel (22.2%), fragrance mix (14.8%), paraben and parthenium 11.1% each. The most common allergens varied in different groups as described, however, in general most common allergens were nickel sulphate, cobalt sulphate, fragrance mix and potassium dichromate.

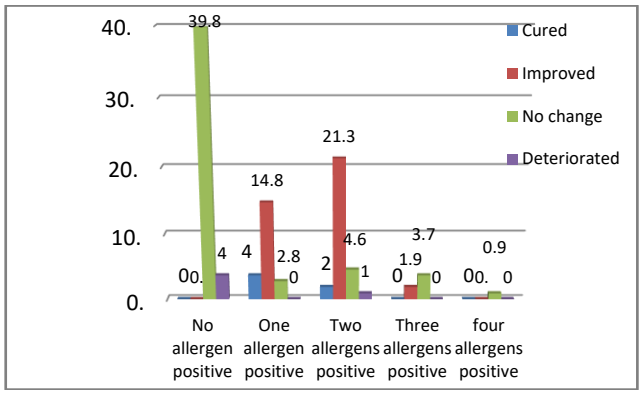

Figure 2: Follow up results in relation to outcome (n=108).

Table 3: Duration of symptoms.

Duration	Atopic dermatitis		Nummular eczema		Pompholyx		Seborrhoeic dermatitis		All patients	
	N	%	N	%	N	%	N	%	N	%
≤6 months	3	11.1	10	37.0	13	48.1	1	3.7	27	25.0
6-12 months	10	37.0	5	18.5	3	11.1	11	40.7	29	26.9
1-5 years	9	33.3	11	40.7	10	37.0	13	48.1	43	39.8
>5 years	5	18.5	1	3.7	1	3.7	2	7.4	9	8.3
Total	27	100.0	27	100.0	27	100.0	27	100.0	108	100.0
Mean±SD	4.58±7.21		2.40±3.87		2.06±2.76		2.65±2.25		2.93±4.51	

Table 4: Number of allergens positive in relation to outcome (n=108).

Number of antigens positive for patch test	Cured		Partially cured		No change		Deteriorate	
	N	%	N	%	N	%	N	%
No allergen positive	0	0.0	0	0.0	43	39.8	4	3.7
One allergen positive	4	3.7	16	14.8	3	2.8	0	0.0
Two allergens positive	2	1.9	23	21.3	5	4.6	1	0.9
Three allergens positive	0	0.0	2	1.9	4	3.7	0	0.0
Four allergens positive	0	0.0	0	0.0	1	0.9	0	0.0
Total	6	5.6	41	38.0	56	51.9	5	4.6

Inference: Patch positivity is significantly associated with cured and partially cured outcome with c^2=29.355; p<0.001**

Upon follow up of the patients, 06 (5.6%) patients showed complete cure and 41 (38%) showed partial improvement. The eczema of 56 (51.9%) patients remained same and 5 (4.6%) deteriorated. Of the 5 patients which deteriorated, 4 did not show any reaction and hence no avoidance measures were applicable, the 5th patient was in the atopic dermatitis group and showed positivity to 2 allergens (Figure 2).

The follow up results of the study have shown that patch positivity is significantly associated with the cured and partially improved outcome with c^2=29.355; p value<0.001 (Table 4).

Follow up results as per each eczema group is as per Figure 3.

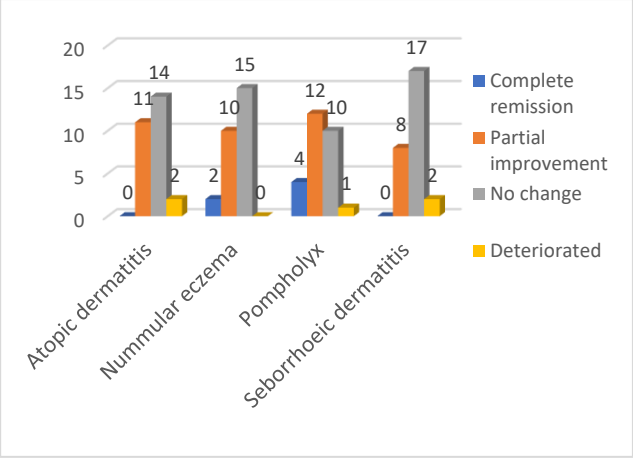

Figure 3: Follow up results as per eczema group.

DISCUSSION

The entire study group as a whole was homogenous for the age distribution but the individual eczemas had age preponderance in accordance with the literature wherein most of atopic dermatitis patients in this study were less than 20 years of age whereas patients with nummular eczema were mostly more than 40 years old.[15,16] Although females were less than males in each of the four eczema groups they formed a maximum of 48.1% in atopic and 44.4% in the pompholyx group and a minimum of 22.2% in the seborrhoeic dermatitis group. This is in accordance with most studies which find a male preponderance in seborrhoeic dermatitis and an increased prevalence of pompholyx in young women.[17]

Atopic dermatitis

The family history of atopy was found only in 22.2% patients which is much less than those given in the western literature, but the figures are in agreement with the Indian studies, which have found 10-16% prevalence.[3,18] About 14 patients (51.9%) were positive for one or more antigen which is in variance to the literature which quotes less positive reactions, about 14 to 40% this variance could be the result of a small sample size.[19]

Nummular eczema

History of atopy was present in 14.8% patients which is in accordance with the available literature.[20] About 59.3% patients were positive for one or more antigen which is in agreement with other studies.[1]

Pompholyx

History of atopy was found in 22.2% of cases which is less in variance to most of the literature where figures are as high as 40 to 50%, but again this could be because of the lower prevalence in India of atopy as such.[18,21] Most common antigens were nickel (40.7%), cobalt (29.6%), fragrance and neomycin sulphate 11.1% each whereas, other studies have found chromium, cobalt, and nickel as common agents.[22,23]

Seborrheic dermatitis

Total 10 patients (37%) were positive for one or more allergen. Most common allergens were nickel, fragrance mix, paraben and parthenium each. There are very few studies of patch test in seborrhoeic dermatitis and they have also found nickel as one of the most common allergen positive along with balsam of peru.[16]

The follow up results of the study have shown that patch positivity is significantly associated with the cured and partially improved outcome with $c^2=29.355$; $p<0.001$.

Limitations

It is not possible to compare the results of this study, since there is no data available in literature regarding clinical outcome using patch test in endogenous eczemas. However, there are certain studies in pruritus vulvae and lichen sclerosus, using European standard battery, which have shown similar clinical results (cure/improvement in 55%).[24] In the absence of any 'gold standard' test for endogenous eczemas the test used in the present study cannot be validated, despite showing strong statistical significance.

CONCLUSION

The results of patch testing in this study are in accordance with other studies done in endogenous eczemas with a statistically significant high patch test positivity rate. This study gives enough evidence to recommend inclusion of patch test in the management protocol of endogenous eczemas especially those not responding to conventional treatment, affecting livelihood or lifestyle.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Bahuguna A, Mahajan S, Yadav AK, Sood A, Lathwal S. Evaluation of the role of patch test in endogenous eczemas. Int J Community Med Public Health 2021;8:161-6.