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THE OCCURRENCE AND PATTERN OF FRAGRANCE CONTACT ALLERGY AND ITS CLINICAL RELEVANCE IN PATIENTS WITH HISTORY OF CONTACT WITH FRAGRANCES

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Abstract:
Background: *Fragrances are common causes of allergic contact dermatitis. General population suffering from fragrance contact allergy (FCA) range from 1-4%.*
Objective: *We conducted this study to define the occurrence and pattern of Fragrance contact Allergy and its clinical relevance in a sample of patients with history of contact with Fragrances.*
Study Design: *Observational study.*
Place and Duration: *This study was carried out in the department of Dermatology of PIMS Islamabad from December, 2018 to November, 2019 for the duration of 12 months.*
Methodology: *Patients of age 15-60 years, of either sex, having recurrent red or itchy skin lesions and were suspected of Allergic contact dermatitis to Fragrances, presenting to the Department of Dermatology of PIMS Islamabad were enrolled in the study. Patch testing was performed with European standard series (ESS) and Fragrance standard series. Patches were left in place for 48 hours and then removed. Patch test readings were taken at 48 hours, 72 hours and at 120 hours after application of allergens. Patch testing was performed in all patients on their upper back.*
Results: *Fragrance contact allergy was detected in 16.5% (24/145) patients. ESS detected 12 patients. FSS detected 24 patients, means FSS detected 12 more patients that ESS would have missed if used alone. No single allergen was detected as more common than others.FM-II, Jasmine and sandal wood oil was commoner than others responsible for 2% of cases each.*
Conclusion: *Fragrance contact allergy is common in population of Faisalabad due to availability of diverse type of cosmetics, soaps, shampoos, deodorants& body sprays.*
Keywords: *Allergens, cosmetics, Allergic contact dermatitis.*

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INTRODUCTION:

Fragrances are commonly blamed as culprits of allergic contact dermatitis (ACD). Among general public its frequency is between 1 and 4% and among sufferers of contact allergy due to fragrances, its frequency is between 6 and 14%.[1]

Our environment is full of natural and artificial fragrances and sources of these are present in beautifying products (cosmetics), medications, products used for purpose of cleaning, perfumes, industry and food.[2,3,4] Nearly two thousand fragrant chemicals are consumed in the manufacturing of perfumes, out of which more than hundred chemicals are considered as allergens causing Allergic contact dermatitis.[4] people at extremes of age with repeated exposure are more at risk of getting Fragrance induced allergic contact eczema.[5] common sites for getting fragrance allergy are face, hands, neck, posterior aspect of ears and the axillae, however it can be widespread.[2,3]

Out of large no of fragrance allergens, there are 3 mixtures of allergens which are commonly used for screening to check fragrance contact allergy by European standard series in their patch test. Fragrance mixture I (FM I) Among the sufferers of fragrance contact allergy, nearly 70% suffer from Allergic contact eczema to FM I. [6]. Balsam from Peru 50% people can have ACD to Balsam of Peru. [7] As these two Allergens can cross react so it was expected initially that up to 90% of patients can be found positive.[6] Recently that figure dropped to 60-70%. [8]

Fragrance mixture II (FM II) is an additional mixture in fragrances, which can detect up to 35% of sufferers who are allergic to fragrances but are missed by using FM I alone. [9] It consists of six fragrance chemicals that are used in making of perfumes. [10] Lyral, which is constituent of FM II is used in concentration of 5% in European standard series rather than 2.5% to pick more cases of FM II contact allergy. [11]

METHODOLOGY:

This observational study was carried out in the department of Dermatology of PIMS Islamabad from December, 2018 to November, 2019 for the duration of 12 months. Non-probability purposive sampling technique was used. Total of 145 patients were enrolled in the study.

All patients of either sex with age 15-60 years coming to dermatology department of PIMS Islamabad who developed recurrent redness or itching on skin after using some product for cleaning or beautifying, which was suspected to have fragrance in it, were included in the study. Patients having any bacterial, viral or fungal skin disease in addition to allergic contact dermatitis, systemic diseases like Diabetes, Hypertension, ischemic heart disease and malignancy, patients on systemic steroids or immunosuppressant drugs were excluded from the study.

A detailed history with special reference to the type of product used, duration of application and extent of body area to which the cosmetic product is applied, was taken. Patch testing was performed by placing standardized concentrations of contact allergens (which are present in European standard series) on plastic (IQ) chambers and attaching the set of these to skin of the back with hypoallergenic paper tape. Patches were left in place for 48 hours and then removed. Patch test reading was taken at 120 hours after application of allergens. Patch testing was performed with European standard series in all patients on their upper back. Follow up was done by taking contact number of patients. Results were read after 120 hours.

RESULTS:

Total of 145 patients were included in the study. SPSS version 20 was used for data analysis. Mean and standard deviation was calculated for all quantitative variables. Frequency and percentage were calculated for all quantitative variables like gender and type of allergens. Effect modifiers like age and gender were controlled by stratification. Post stratification chi-square test was applied which showed a value of 2.785 with the P-value of 0.594.

Table No 01: Age Distribution of Patients

Age Group	FCD +ve		Total
	Yes	No	
<20 years	01	5	06
21-30 years	12	41	53
31-40 years	05	34	39
41-50 years	04	33	37
51-60 years	02	08	10
Total	24	121	**145**

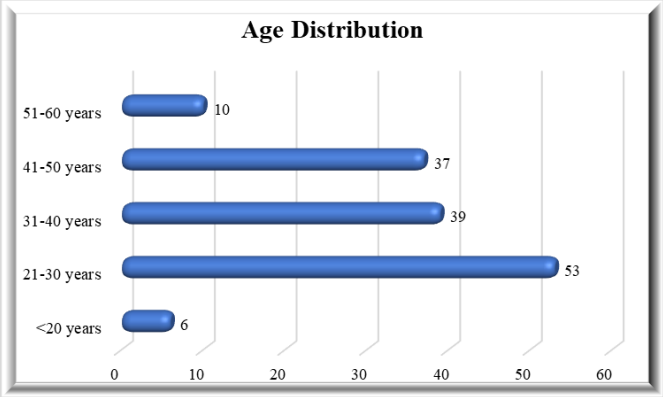

Table No 02: Gender Distribution of Patients

GENDER	FCD +VE		TOTAL
	Yes	No	
MALE	07	46	53
FEMALE	17	75	92
TOTAL	24	121	**145**

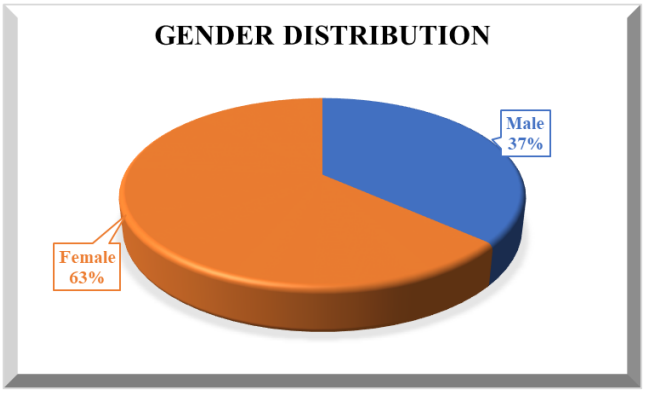

Table No 03: Pattern of Fragrance Contact Dermatitis

Face		Axilla		Neck		Scalp		Hands		Total	
F	M	F	M	F	M	F	M	F	M	F	M
6	3	4	1	3	0	1	1	3	2	17	7
9		5		3		2		5		24	

Table No 04: Positive Allergens in ESS

	Fragrance Mix-I	Fragrance Mix-II	Balsam of Peru	Total
FCD +ve	2	8	2	12

Table No 05: Positive Allergens in FSS

Name of Allergen	Patient with +ve patch test	Percentage
Balsum Of Piru	2	1.38%
Cinamic Aldehyde	2	1.38%
Cinamic Alcohol	1	0.70%
Isoeugenol	1	0.70%
Amyl Cinamyl Alcohol	1	0.70%
Fm-Ii	3	2 %
Citral	2	1.38%
Lavender Absolute	2	1.38%
Oakmoss Absolute	2	1.38%
Jasmine Synthetic	3	2%
Ylang-Ylang Oil	2	1.38%
Sandal Wood Oil	3	2%

DISCUSSION:

It is not practical to test a high number of allergens because of the increased cost, longer time needed for preparation of the test series and the limited test area on a patient's back. The major factor for selecting a fragrance allergen for patch testing, therefore, should be the contact allergy rate. However, testing with fragrance allergens has always been difficult because the clinically relevant spectrum of fragrance allergens keeps changing as a result of the introduction of new allergenic chemicals in products and phasing out of others.

In our study European standard series caught 12 patients with clinically relevant positive allergic reactions. It also picked few other positive reactions but these were not clinically relevant. Fragrance series picked 24 allergens, which is double the amount of positive patch test reactions picked by ESS. So, if the European standard series is used alone, we may miss many important fragrance allergens as described in previous studies. In our study, we calculated the frequency of Fragrance contact allergy in patients of contact dermatitis and its clinical relevance in Faisalabad. Among 145 patch tested patients, 24 (16.5%) were found positive which is comparable to previous studies. [12,13] 7.2% of Fragrance contact dermatitis patients were found positive in present study, which is less as compared to study conducted by Nardelli et al., [14] which found 14.5% positive patients.

In report presented by Nardelli et al., FM I and FM II were recognized as 9% and 2.1% of Fragrance contact allergy patients .14 In the study by Van Oosten et al., [15] Fragrance contact allergy was found in 10.3% of individuals, and the FM I was responsible for 5.8% cases and FM II was responsible for 9.3% cases. Previous reports [12-16] showed that the hand and the face were the more commonly involved body sites in

individuals having allergic contact eczema to fragrant chemicals. However, different body sites are involved in some of the studies.[17] As fragrances are present in wide variety of materials such as soaps, shampoos, body washes, shaving creams, after shave lotions, waxes, products used for cleaning purposes, polishing materials and almost all beautifying products, which we apply by using our hands, it is expected that hands are the most common site of involvement.[14] But Our study does not support this finding as our study showed face as most common site of involvement in FCA patients.

CONCLUSION:

In conclusion patch testing using European standard series picks a smaller number of patients with Fragrance contact allergy and is not able to differentiate exact fragrance allergens. If we use a separate series of allergens containing only the fragrance allergens along with the usual series of allergens then this can increase the chances of finding a greater number of patients having fragrance contact dermatitis. Although Fragrance contact eczema is less in Faisalabad in comparison to different studies from Europe, but it looks to be more relevant clinically.

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