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Frequency and Pattern of Fragrance Allergy in Faisalabad

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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:** To determine the frequency and pattern of Fragrance contact Allergy and its clinical relevance in a sample of patients in Faisalabad with history of contact with Fragrances. **Study design:** Observational study. **Place of study:** Department of Dermatology of DHQ Hospital Faisalabad. **Period of study:** 3 years from 01-06-2014 to 31-05-2017. **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, DHQ Hospital, Faisalabad 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.[2–4] 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 particular mixtures of allergens which are commonly used for screening to check fragrance contact allergy by European standard series in their patch test:

1. Fragrance mixture I (FM I) Among the sufferers of fragrance contact allergy, nearly 70% suffer from Allergic contact eczema to FM I.[6]

2. 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]

3. Fragrance mixture II (FM II) is an additional mixture in fragrances, which can detect up to 35% of sufferers who are actually 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

Study Design: Observational study.

Place of Study: Department of Dermatology, DHQ Hospital Faisalabad-Pakistan.

Duration of Study: 3 years from 01-06-2014 to 31-05-2017.

Sample Technique: Non-probability purposive sampling technique was used.

Sample Size: Total of 145 patients were enrolled in the study.

Methods:

All patients of either sex with age 15-60 years coming to dermatology department DHQ Hospital Faisalabad 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. It was a cross sectional 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

SPSS version 22 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.

Table 1 Age distribution of patients

		FCD +ve		Total
		Yes	no	
Age	< 20 years	1 16.7%	5 83.3%	6
	21-30 years	12 22.6%	41 77.4%	53
	31-40 years	5 12.8%	34 87.2%	39
	41-50 years	4 10.8%	33 89.2%	37
	51-60 years	2 20.0%	8 80.0%	10
Total		24	121	145

Chi-Square Tests

	Value	p-value
Pearson Chi-Square	2.785	.594

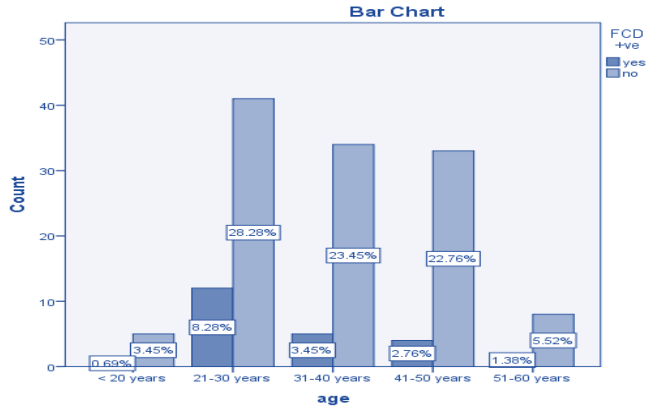

Figure 1: Age distribution of patients

Table 2 Gender distribution of patients

		FCD +ve		Total
		Yes	No	
Gender	male	7 13.2%	46 86.8%	53
	female	17 18.5%	75 81.5%	92
Total		24	121	145

Chi-Square Tests

	Value	p-value
Pearson Chi-Square	.676	.411

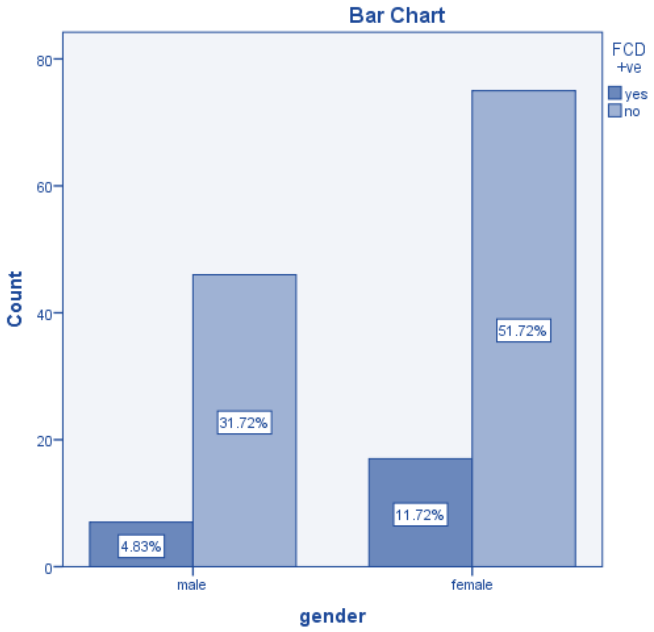

Figure 2: Gender distribution of patients

Table 3 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 37.5%		5 20.8%		3 12.5%		2 8.3%		5 21%		24 100%	

F = Female, M = Male

Table 4 positive Allergens in ESS

	Fragrance Mix-I	Fragrance Mix-II	Balsum of piru	Total
FCD +ve	2	8	2	12

Table 5 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] 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 less 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 more 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.

REFERENCES

1. Marks JG, Belsito DV, DeLeo VA et al. North American Contact Dermatitis Group patch test results for the detection of delayed-type hypersensitivity to topical allergens. J Am Acad Dermatol 1998; 38(6):911–8.
2. Tomar J, Jain VK, Aggarwal K et al. Contact allergies to cosmetics: testing with 52 cosmetic ingredients and personal products. J Dermatol. 2005;32(12):951–5.
3. de Groot AC, Frosch PJ. Adverse reactions to fragrances. A clinical review. Contact Dermatitis. 1997;36(2):57-86.
4. Johansen JD. Fragrance contact allergy: a clinical review. Am J Clin Dermatol. 2003;4(11):789-98.
5. Buckley DA, Rycroft RJ, White IR et al. The frequency of fragrance allergy in patch-tested patients increases with their age. Br J Dermatol. 2003;149(5):986-9.
6. Larsen WG, Nakayama H, Fischer T et al. Fragrance contact dermatitis – a worldwide multicenter investigation (Part-III). Contact Dermatitis. 2002;46(3):141-4.
7. Schnuch A, Lessmann H, Geier J et al. Contact allergy to fragrances: frequencies of sensitization from 1996 to 2002. Results of the IVDK. Contact Dermatitis. 2004;50(2):65-76.
8. Castanedo-Tardan MP, Zug KA. Patterns of cosmetic contact allergy. Dermatol Clin. 2009;27(3):265-80.
9. Frosch PJ, Pirker C, Rastogi SC et al. Patch testing with a new fragrance mix detects additional patients sensitive to perfumes and missed by the current fragrance mix. Contact Dermatitis. 2005;52(4):207-15.
10. Bruze M, Andersen KE, Goossens A. Recommendation to include fragrance mix 2 and hydroxyisohexyl 3-cyclohexene carboxaldehyde (Lyral) in the European baseline patch test series. Contact Dermatitis. 2008;58(3):129-33.
11. Buckley DA. Fragrance ingredient labelling in products on sale in the UK. Br J Dermatol. 2007;157(2):295-300.
12. Kashani MN, Gorouhi F, Behnia F et al. Allergic contact dermatitis in Iran. Contact Dermatitis. 2005;52(3):154-8.
13. Firooz A, Gorouhi F, Davari P et al. Frequency of contact sentization to European Standard Series (ESS) in contact and/or atopic dermatitis patients in Rasht, Ahwaz, Kerman and Hamedan. Iranian J Dermatol. 2007;10:187–96.
14. Nardelli A, Carbonez A, Ottoy W et al. Frequency of and trends in fragrance allergy over a 15-year period. Contact Dermatitis 2008;58(3):134–41.

15. van Oosten EJ, Schuttelaar ML, Coenraads PJ. Clinical relevance of positive patch test reactions to the 26 EU-labelled fragrances. Contact Dermatitis. 2009;61(4):217-23.
16. Heydorn S, Menne T, Johansen JD. Fragrance allergy and hand eczema – a review. Contact Dermatitis. 2003;48(2):59-66.
17. Li LF, Liu G, Wang J. Patch test in Chinese patients with cosmetic allergic contact dermatitis to common cosmetic allergens from a European cosmetic series. Contact Dermatitis. 2007;57(1):50-4.

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