



ETIOLOGY OF CONTACT DERMATITIS ON FACE IN INDIAN PATIENTS

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ABSTRACT

Introduction: Facial contact dermatitis has exponentially increased in the past decade because of the freely available over the counter topical medications and the innumerable cosmetics. Patch testing is still the gold standard for diagnosis. **Aims and Objectives:** To elicit the patterns and specific allergens causing facial dermatitis on face in Indian patients. **Materials and methods:** 50 patients of predominantly facial dermatitis with suspected contact dermatitis (CD) were taken up for patch testing. The patients were tested with the Indian standard series (ISS) and Indian cosmetic series and the results were read at 48 and 96 hours. Repeated open application test (ROAT) was performed with the suspected allergens in 33 patients, and the results were read on Days 2, 4, and 7 using the Johansen's Modified scale. **Results:** The mean age of the patients was 48.3 years with M: F ratio of 3:7. The mean duration of the complaints was 20 months, while the mean duration of exposure to the implicated allergen was 10.6 years. Patch test with ISS and cosmetic series were positive in 34% of people with 4-Phenylenediamine base PPD (1%) being the most common allergen in 14 patients. ROAT was positive in 18 patients, out of which 78% were patch test negative. **Discussion:** Patch test has stood the test of time as an invaluable diagnostic aid in patients with dermatitis. Sindoor dermatitis is a commonly encountered ACD in our clinics but the implicated allergens are not a part of ISS or cosmetic series. In our study, ROAT was positive in 8 patients of sindoor dermatitis who were patch test negative. Thus, ROAT should also be ideally be performed in these patients.

KEYWORDS : Patch testing, ROAT, facial dermatitis

INTRODUCTION

There has been an exponential increase in contact dermatitis (CD) of the face due to the freely available innumerable cosmetics in the market. Patch testing is the gold standard for the diagnosis of contact dermatitis. An alternative method, repeated open application test (ROAT), is a simple and inexpensive test in which the product is used 'as is', simulating real life situation. Here, we have undertaken a study to find out the etiology of contact dermatitis of the face in Indian patients.

AIMS AND OBJECTIVES:

To elicit the patterns and specific allergens causing facial dermatitis on face in Indian patients.

MATERIALS AND METHODS:

Fifty patients with CD predominantly on face were evaluated with clinical examination, patch testing and when needed ROAT. All were patch tested with Indian standard series (ISS) and the Indian cosmetic series (ICS) (Systopic Pharmaceutical Ltd) and results were read at 48 and 96 hours using ICDRG criteria¹. The results on Day 4 were considered for evaluation and a reading of at least 1+ was considered positive, only if it correlated clinically with our findings. ROAT was done in 33 patients, in whom patch test was negative or cosmetics or sindoor were the suspected allergens. The suspected products 'as in' were applied twice daily by the patient on 1 cm² area on the volar aspect forearm for 7 days and results were read on days 2, 4 and 7 using the Johansen's Modified scale².

RESULTS:

There were 35 females with male: female ratio of 3:7. Mean age of patients was 48.3 years. The mean duration of the complaints was 20 months, while the mean duration of exposure to the implicated allergen was 10.6 years. The presenting complaints were itching in 40 patients (80%), redness in 24 (48%), burning sensation in 20 (40%) and papules & plaques on the face and scalp in 15 (30%). None of the patients had personal or family history of atopy.

Multiple allergens were suspected in a single patient, with the most common been hair dye in 33(66%), Kumkum/sindoor in 14(28%), sticker bindi in 8(16%), perfume in 5(10%), mustard oil in 3(6%), lipstick in 2(4%) and toothpaste, sunscreen, aftershave and nail polish in 1(2%) each. Patch test was positive in 17/50(34%) of the patients, while ROAT was positive in 18/33(54.5%). Fourteen of these 18 were negative on patch test and would have been missed if ROAT was not performed. Seventeen (34%) patients were negative on both (table 1&2).

Table 1. Results in patch test

Suspected clinically	Allergens	Number of patients patch test positive
Hair dye (33)	4-Phenylenediamine base PPD (1%)	14
	Hexamine	1
	Colophony+ Sorbic Acid	1
	Fragrance mix 5%	1
	Parthenium	1
	Negative patch test	17
Kumkum (14)	4-Phenylenediamine base PPD (1%)	2
	Hexamine	1
	Colophony + Sorbic Acid	1
	Negative patch test	10
Bindi (8)	4-Phenylenediamine base PPD (1%)	2
	Colophony + Sorbic Acid	1
	Negative patch test	5

Table 2. Results on ROAT

Allergen suspected (n)	ROAT results	Number of patients
Kumkum (14)	To Kumkum/sindoor	7
	To Sticker bindi	1
	Negative	6

Hair dye (33)	To Hair dye	9
	To Kumkum/sindoor	2
	Negative	6
	Not done	16
Bindi (8)	To Sticker Bindi	1
	To Kumkum/sindoor	3
	Negative	4

Of the 33 with suspected hair dye CD, 14 were patch test positive to PPD, while 9 had ROAT positive to their hair dye. Of the 14 with suspected CD to Kumkum, 2 had patch test positive to PPD, 1 to hexamine and 1 to colophony and Sorbic Acid and 7 had ROAT positive to kumkum, while 1 had ROAT positive to her sticker bindi. (Figures 1a and 1b) None of these 8 positive with ROAT were patch test positive.



Figure 1a. Patient of suspected contact dermatitis to sindoor (with erythematous scaly plaque at site of application of sindoor), showing ROAT positive (discrete vesicles seen) to sindoor on Day 7.



Figure 1b. Patient of suspected contact dermatitis on face (erythematous papules and plaques on the bilateral cheeks and forehead) showing patch test positive to Colophony and Sorbic Acid on Day 4.

After clinical evaluation, patch test and ROAT, final diagnosis was hair dye dermatitis in 22 (44%), kumkum dermatitis in 8 (16%), bindi and lipstick dermatitis in 1 (2%) each, while no cause could be elicited in 17 (34%). (Table 3)

Table 3. Final diagnosis

Final Diagnosis	Number of patients
Hair dye dermatitis-	22 (44%)
Kumkum dermatitis-	8(16%)
Bindi dermatitis	1(2%)
Lipstick dermatitis	1(2%)
No cause elicited-	17 (34%)

DISCUSSION:

Possible agents implicated to cause contact dermatitis on face

include hair dye, lipstick, kumkum, face cream, perfume and kajal³, while the allergens are paraphenylenediamine, thimerosal, nickel sulphate hexahydrate and fragrance mix⁴. Allergens in kumkum implicated to cause dermatitis are turmeric, sudan-, 4-aminoazobenzene, brilliant lake red R and cananga oil.⁵ Allergens in sticker bindi are polyvinylchloride (PVC) and the adhesive material containing para-tertiary butyl phenol (PTBP)⁶. Kumkum dermatitis is a commonly encountered pattern in our clinics, seen in 16% cases, but the implicated allergens are neither a part of ISS nor cosmetic series. We also found hexamine as an allergen in Kumkum which is present in adhesives, coatings, in the preservation of hides, treatment of urinary tract infection and as cross-linking agent for hardening phenol-formaldehyde resins and vulcanizing rubber.

We found that for suspected CD to Kumkum/sindoor or bindi, only 4 were patch test positive, while 8 were ROAT positive. None of these 8 were patch test positive. Hence, ROAT performed better than patch test in picking up suspected CD to Kumkum/sindoor or bindi in our study. Possible reason is lack of inclusion of common allergens implicated in causing CD to Kumkum/sindoor or bindi in ISS or ICS. Small number of patients and lack of suspected antigens for performing patch test were few limitations of our study. We feel that addition of allergens like PTBP, Turmeric, Sudan-1, 4-aminoazobenzene, brilliant lake red R, cananga oil, PVC and PTBP to ISS or the cosmetic series and performing both patch testing and ROAT in these cases is needed for better diagnosis.

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