

Preliminary experience of patch testing at Srinagar, Kashmir

Sir,

Allergic contact dermatitis (ACD), a delayed type of hypersensitivity reaction developing in sensitized individuals after environmental exposure to allergens, is a challenging problem with considerable morbidity and economic impact.^[1,2] Prevention of contact with the incriminating allergens forms the main component of management of ACD, and patch testing is a useful tool for detecting it.^[2] The exposure to allergens and the type of allergens included in standard patch test series varies considerably from area-to-area, depending on the local experience.^[1]

We conducted the study with the aim of having preliminary experience of patch testing in Kashmir, in the newly set-up contact dermatitis clinic of our department. All consecutive clinically suspected cases of ACD of all age groups visiting the clinic over a period of 7 months, from mid-May to mid-December 2012, were included in the study. Details regarding

age, sex, occupation, residential background, duration and pattern of disease were recorded in case sheet after obtaining written informed consent. Personal or family history of atopy, present or past history of hypersensitivity and other dermatological and systemic illness was also recorded. Those with atopy, hypersensitive reactions were excluded in order to avoid false positive results. Cases were subjected to patch testing as per the standard guidelines, taking all necessary precautions. Patch test series used was Indian standard series (ISS), containing 25 allergens, and approved by contact and occupational dermatitis forum of India. Patch testing with conventional ISS was undertaken for convenience of getting a variety of allergens combined in a single battery. We did not select any particular occupational group or a specific patient group and so did not use any specific allergen series. Reading and grading of positivity was carried out according to International Contact Dermatitis Research Group guidelines.^[3]

Out of 85 cases patch tested, 49 were males (57.6%) and 36 females (42.4%), with age ranging from 5 years to 72 years (mean age 40.47 years $\pm$ SD 14.84), as described in Table 1. 51 (60%) cases were from urban and 34 (40%) from rural background [Table 1]. The duration of illness ranged from 10 days to 10 years (mean $\pm$ SD = 28.6 $\pm$ 36.20 months). Dermatitis of hands and feet was seen in 45 (52.9%) cases; non-specific pattern in 27 (37.8%), air borne contact dermatitis (ABCD) in 10 (11.8%), and photo ACD in 3 (3.5%) cases.

Out of 85 cases patch tested, 33 (38.8%), 19 males and 14 females, showed positive reactions. 20 cases showed positive reaction to one allergen and 13 to more than one, giving a total of 56 reactions. Thirty-four positive reactions were seen in males and 22 in females. Most common allergens identified were potassium dichromate and nickel sulfate showing nine reactions

Table 1: Age, sex, residential distribution of cases

Age group	Males (%)	Females (%)	Total (n=85) (%)	Rural (%)	Urban (%)
≤10 years	01	01	02	00	02
11-30 years	09	17	26 (30.59)	15	11
31-50 years	27	12	39 (45.9)	12	27
51-70 years	11	06	17	06	11
≥71 years	01	00	01	01	00
Total (n=85)	49 (57.6)	36 (42.4)	85 (100)	34 (40)	51 (60)
Average age	40.47 ($\pm$ 14.84 SD)				
Average duration of illness	28.6 ($\pm$ 36.20 SD) months				

(16.1%) each. Cobalt chloride showed 6 (10.7%), thiuram mix 5 (8.9%), P-phenylenediamine (PPD) 4 (7.1%), and colophonium 4 (7.1%) reactions.

In males, the most common reactions were observed with potassium dichromate showing nine reactions (26.5%), followed by 5 (14.7%) with thiuram mix. In females, the most common allergen was nickel sulfate with nine reactions (40.9%), followed by 5 (22.7%) with cobalt chloride. Positive reaction exclusively in males was seen with potassium dichromate, PPD, mercapto mix, 2-mercaptobenzothiazole, nitrofurazone, lanolin alcohol, thiuram mix, black rubber mix, formaldehyde, and parthenolide. Positive reactions exclusive to females were due to benzocaine, nickel sulfate, and polyethylene glycol 400. No reaction was seen with petrolatum, paraben mix, gentamicin, epoxy resin, p-chloro-m-cresol, and clioquinol. Overall present relevance rate was 55.4% (31 reactions out of 56) and the results are summarized in Table 2. The occupational status of the study group and its relation with positive reaction is summarized in Table 3.

The age, sex and duration of illness variables in our study were similar to other studies.^[1,2,4-7] 60% cases were from urban background, probably because our hospital is located in the main city. Dermatitis of hands and feet was the most common clinical pattern in our study, similar to some studies from India and abroad^[2] and different from other Indian studies where ABCD is common.^[7]

Nearly 38.8% positive reaction in our study is similar to 32.3% by Akasya-Hillenbrand *et al.*,^[6] however, differs from positive results of 63.5% by Davoudi *et al.*,^[1] 59% by Bajaj *et al.*,^[2] 63% by Handa and Jindal^[7] and 64.7% by Sudhashree *et al.*^[8] The low positive percentage tested with ISS may be because of different exposure patterns in our population than rest of the country.

The five most common allergens were potassium dichromate and nickel sulfate, followed by cobalt chloride, thiuram mix, PPD and colophonium, similar to other studies.^[1,2,4-8]

Table 2: Patch test results for each allergen of Indian standard series

Allergen	Positive results (n=56) (%)	Males (n=34) (%)	Females (n=22) (%)	Clinical relevance (%)
Petrolatum 100%	00	00	00	
Potassium dichromate 0.5% pet	09 (16.1)	09 (26.5)	00	6
Neomycin sulfate 20% pet	02 (3.6)	01 (2.9)	01 (4.5)	1
Cobalt (II) chloride hexahydrate 1% pet	06 (10.7)	01 (2.9)	05 (22.7)	4
Benzocaine 6% pet	01 (1.8)	00	01 (4.5)	
P-phenylenediamine 1% pet	04 (7.1)	04 (11.8)	00	3
Paraben mix 16% pet	00	00	00	
Nickel (II) sulfate hexahydrate 5% pet	09 (16.1)	00	09 (40.9)	7
Colophonium 20% pet	04 (7.1)	02 (5.9)	02 (9.1)	1
Gentamicin sulfate 20% pet	00	00	00	
Mercapto mix 2% pet	01 (1.8)	01 (2.9)	00	
Epoxy resin 1% pet	00	00	00	
2-Mercapto benzothiazole 2% pet	02 (3.6)	02 (5.9)	00	1
Fragrance mix 2% pet	02 (3.6)	01 (2.9)	01 (4.5)	1
Nitrofurazone 1% pet	01 (1.8)	01 (2.9)	00	
p-chloro-m-cresol 1% pet	00	00	00	
Lanolin alcohol 30% pet	01 (1.8)	01 (2.9)	00	1
Myroxylon pereirae resin 25% pet	02 (3.6)	01 (2.9)	01 (4.5)	1
Thiuram mix 1% pet	05 (8.9)	05 (14.7)	00	2
Clioquinol 5% pet	00	00	00	
Black rubber mix 0.6% pet	01 (1.8)	01 (2.9)	00	
4-tert-Butyl phenol formaldehyde resin 1% pet	03 (5.4)	02 (5.9)	01 (4.5)	1
Formaldehyde 1% aq	01 (1.8)	01 (2.9)	00	1
Polyethylene glycol 400 100%	01 (1.8)	00	01 (4.5)	
Parthenolide 0.1% pet	01 (1.8)	01 (2.9)	00	1
Total	56	34	22	31 (55.4)

Table 3: Positive patch test reactions to various allergens in each occupational group

Occupational group	Number	Allergen	Positive reaction	Total reactions
Housewives	21	Nickel	5	15
		Cobalt	4	
		Colophonium	2	
		Neomycin, myroxylon, benzocaine, PEG	1 each	
Service	21	PPD	4	12
		Fragrance mix, thiuram	2 each	
		Myroxylon, lanolin, black rubber, potassium dichromate	1 each	
Students	10	Nickel	2	4
		Cobalt, PTBP	1 each	
Construction workers	8	Potassium dichromate	6	13
		Thiuram mix, MBT	2 each	
		Colophonium, Mercapto mix, nitrofurazone	1	
Farmers	6	Potassium dichromate, thiuram, formaldehyde, parthenolide	1 each	4
Cottage Industry workers	6	PTBP	2	4
		Potassium dichromate, cobalt	1 each	
Business	5	Colophonium, neomycin	1 each	2
Medical professional	5	Nickel	2	2
Unemployed	2			
Automobile industry/driver	1			
Total	85		56	56

PEG: Polyethylene glycol, PPD: P-phenylenediamine, PTBP: 4-tert-Butyl phenol, MBT: 2-Mercapto benzothiazole

In our study, all reactions to potassium dichromate, thiuram mix, and PPD were seen exclusively in males and all reactions to nickel sulfate and most to cobalt (5 out of 6), in females, similar to other studies.^[1,2,7,8] In Kashmir, most of the construction and outdoor labor work is carried out by males and females are not involved much in outdoor work especially, construction (cement) work. So all positive reactions to potassium dichromate in our study were found in males and no female was found positive because of the above reason.

We found only one positive reaction to parthenolide than the high positive percentage seen in other Indian studies.^[2,7] The positivity to parthenolide does not mean a definite implication of Parthenium weed for the ACD and does not have much sensitivity. Exposure level to Parthenium plant as such is very low in Kashmir, which could be the reason for low positivity in this preliminary study.

In conclusion, this preliminary study conducted to experience the results of patch testing at our center reveals results generally similar to that of other centers, both in country and abroad. Few differences, though, may be because of different climatic conditions,

traditional, and cultural values in Kashmir causing different exposure patterns. We intend to carry forward the study in order to obtain larger data.

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