



## CLINICAL EVALUATION AND PATCH TESTING IN HAND ECZEMA

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**ABSTRACT**

Hand eczema is one of the most common occupational dermatological condition. Chronicity and recurrence nature of hand eczema leads to loss of work and quality of life of workers. In order to identify the causative factor patch test could be relevant test. Out of 340 employees screened, 46 employees (13.5%) suffered from hand eczema. The most common type was wear and tear dermatitis accounting for 17 (36.9%) cases, followed by discoid eczema, pompholyx, focal palmar peeling, finger-tip eczema, hyperkeratotic eczema, ring eczema, and unspecified types. Patch testing was positive in 15 (32.6%) cases. The most common allergen was paraphenylene diamine, followed by fragrance mix, nitrofurazone, mercaptobenzothiazole, potassium bichromate, black rubber mix, and thiuram mix. A statistically significant association (0.001) was found with an underlying history of atopy.

**KEYWORDS :** Hand eczema, Occupational, Patch testing.

**INTRODUCTION**

Hand eczema is a descriptive diagnosis for dermatitis largely confined to the hands, and it does not make any presumption about the etiology. It may be endogenous or exogenous (allergic or irritants) in origin. Most of the cases of hand eczema have a multifactorial etiology, wherein the eczema is caused and perpetuated by exogenous factors in individuals who are susceptible to such processes due to endogenous factors. Identification and avoidance of the external contactants is of paramount importance in appropriate management of hand eczema. As clinical differentiation between chronic allergic and irritant hand eczemas is often difficult, patch testing becomes an important diagnostic tool for identification of the allergen/allergens responsible for the eczema. Patch testing is a well established method of diagnosing allergic contact dermatitis. Patients with a history and clinical picture compatible with contact dermatitis are reexposed to suspected allergens under controlled conditions to verify the diagnosis. Properly applied and correctly interpreted patch tests are, at present, the only scientific proof of allergic contact dermatitis. This study was conducted to identify the allergens showing positive reactions in patch test in patients with hand eczema.

**MATERIAL AND METHODS**

A detailed history was recorded with particular emphasis to occupation, types of agents handled during daily activities, and a thorough clinical examination was done to document the distribution patterns and types of lesions. KOH examination of scrapings from the lesions was carried out in all the patients to rule out dermatophytosis and scabies. Patch testing was done in all cases utilizing the Indian standard series approved by CODFI (Contact and Occupational Dermatoses Forum of India) and manufactured/supplied by Systopic Laboratories, New Delhi. The standard patch testing technique using aluminium chambers was done and reactions were interpreted as recommended by International Contact Dermatitis Group (ICRG). Patch testing with the plant antigens was done in suspected individuals. All the housewives were patch tested with 8 % solution of the soap used by them and with onion and garlic paste freshly prepared. Oils and other liquid contactants were used as such in suspected individuals. The results were tabulated and analyzed. Ethical committee clearance was taken from the institute.

**RESULTS**

Out of 340 employees screened, 46 employees (13.5%)

suffered from hand eczema. The most common type was wear and tear dermatitis accounting for 17 (36.9%) cases, followed by discoid eczema, pompholyx, focal palmar peeling, finger-tip eczema, hyperkeratotic eczema, ring eczema, and unspecified types. Patch testing was positive in 15 (32.6%) cases. The most common allergen was paraphenylene diamine, followed by fragrance mix, nitrofurazone, mercaptobenzothiazole, potassium bichromate, black rubber mix, and thiuram mix. A statistically significant association (0.001) was found with an underlying history of atopy.

**DISCUSSION**

A total of 100 patients were included in the study, out of which 76% showed positivity in patch testing in concurrence with the studies done earlier which ranges from 50% to 92.5%. Minocha 97 et al., reported 56.5% contact sensitivity among the patients with palmar hyperkeratotic dermatitis. Templett 98 et al., reported 54.4 % among patients with hand eczema. Huda 99 et al., reported 92.5% positivity among patients with hand dermatitis. Kishore 100 et al., reported 82.5% positivity among hand eczema. Laxmisha 101 et al., reported 52.5% positivity among patients with hand eczema. Majority of our patients belong to 31-50 yrs age group and the mean age of patients who showed positive results was 44.23 which is in concurrence with other studies. 100,102 The mean age of men and women who showed patch test positivity were 48.58 and 39.14 respectively. Women showed positive patch test at an earlier age, this could be because of the earlier sensitization to allergens like nickel, cobalt and fragrance mix used in artificial jewelries and cosmetic products. Among the 100 patients studied 57 (57%) were males and 43 (43%) were females, the ratio being 1.32:1 which is contrary to most studies where the incidence was higher in females. 97,98,103 This could be because of high number of semiskilled construction workers in our study group. Kishore 100 et al., and Laxmisha 101 et al., reported male predominance in their study group. Atopic diathesis is the most common endogenous cause of hand eczema. In our study group 16% of patients were atopics. Suman and Reddy reported history of atopy in 36% of their patients with hand eczema. 8104Laxmisha 101 et al., had reported that only one out of 36 patients had atopy history in their study group. Occupation has significant bearing on hand eczema because of exposure to various contactants at workplace. 105.106 In fact, occupational hand eczema comprises 90% to 95% of all occupational skin diseases in Denmark. 105 Among the various occupational groups, housewives formed the majority

and accounted for 31% of total cases in our study, which is in concordance with other studies.<sup>97,100,104</sup> This can be explained on the basis of their coming in contact with agents of wide variety during day to day routines of household work of cooking, washing, cleansing and milking, feeding of animals particularly by housewives of rural background in India. Masons constituted second major group (27%) which is higher when compared to Laxmisha <sup>101</sup> et al., and Suman and Reddy <sup>104</sup> who has reported 14% masons in their study group. This could be because of the growth in construction industry in our region. The other occupational groups encountered in our study were, farmers (10 %), painters (6 %), hotel workers (4 %), clerk (4 %), flower vendors (3 %), security (3 %), welder (3 %), tailor (2 %), barber (1 %), mechanical engineer (1%), leather worker (1 %), plumber (1 %), press (1 %), nurse (1 %) and student (1 %). The contact with water, which is hypotonic, and the dissolution of the surface lipids by detergents or solvents, may be the reason for a higher incidence of contact allergy in people involved in the above occupations. The most common sensitizer in our study group was potassium dichromate, constituting 44.73 % (34) with a male predominance (85.29 %). This could be because of a large number of construction workers in our study group. Chromates are present in cements, leather, matches, bleaches, yellow paints, varnishes, certain chromates containing glues, soap, and detergents.<sup>107</sup> Chromates are part of earth's crust, and traces of chromates are present in practically all raw materials.<sup>107</sup> Similar findings were reported by Laxmisha <sup>101</sup> et al., and Kishore <sup>100</sup> et al.,. The next common allergen was nickel sulphate i.e., 17.10 % (13), with a female predominance (84.61 %). Majority of the patients with nickel allergy were house wives as they are exposed to utensils, door handles, knobs, artificial jewelry etc. Nickel is ubiquitous in the environment and constitutes about 0.008% of the earth's crust. Nickel in metal and salt form gives rise to contact allergy, metallic nickel only after corrosion.<sup>108</sup> The corrosiveness of sweat, saliva and other body fluids to nickel and nickel alloys is of primary importance. Similar findings have been reported in various studies.<sup>103,109,110</sup> Among those positive patients the common sensitizer in males was potassium dichromate (70.73%) and in the females it was nickel sulphate (31.42%).

## CONCLUSION

We encountered a high degree of patch test positivity in patients with hand eczema and the Indian standard series proved to be very useful, but lacking in certain cases like hand eczema in housewives. Housewives formed the bulk of our study group and a high degree of sensitivity to vegetables has been established in the past. Inclusion of the extracts of common vegetables and fruits in the series would be of immense value. Since more than half of hand dermatitis cases may be related to occupation, a thorough history should be taken by a knowledgeable clinician. Potentially relevant allergens in the workplace must be identified and tested. These allergens may not be contained in standard trays. A specific patch test series for the hands as in footwear series or textile series will be an aid in diagnosis of hand eczema.

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