Common Contact Sensitizers among Patients with Hand Eczema: A Multicenter-Study in Nepal

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Abstract

Introduction: Allergic contact dermatitis in Nepal is not an uncommon disorder. Patch testing is a well established method of diagnosing allergic contact dermatitis. Patients with contact dermatitis are well known to have impaired quality of life which often leads to frequent dermatological consultations.

Objective: Lack of data from Nepal has prompted us to undertake this study with the aims to know the frequency of allergic contact dermatitis and the commonest contact allergens among the patients with Hand eczema attending the out-patient department of dermatology, B.P. Koirala Institute of Health Sciences and Kathmandu Medical College Teaching Hospital.

Material and Methods: A total of 256 patients were included in the study. Out of them 195 with hand eczema agreed to participate and undergo patch testing. The antigens used included the Indian standard series of patch test allergens approved by Contact and Occupational Dermatoses Forum of India.

Results: Hundred and ten cases (56.4%) were patch test positive (PTP) at 48 as well as 96 hours to at least one allergen. PTP was seen more commonly in females. The most common allergen in females was nickel sulphate followed by cobalt chloride, gentamicin and mercapto mix while males were positive to potassium dichromate, followed by epoxy resin, fragrance mix and nickel sulphate.

Conclusion: Patch testing has proved a useful tool for the detection of allergic contact dermatitis and for identification of contact allergens. When positive reactions correlate with environmental exposure the test usually assists the physician in establishing the cause of dermatitis, hence treating the patients and improving their quality of life.

Key words: Hand Eczema, Contact Allergen, Patch test

Introduction

The term hand eczema (HE) implies when the dermatitis is largely confined to the hands with only minor involvement of the other areas. The condition has been described as a chronic disabling and distressing condition both for the physicians and patients alike. The reported prevalence of HE in the general population is estimated to be about 2-10% [1,2] and it accounts for 21-35% of all types of eczema.[3]

The pathogenesis of hand eczema is multifactorial, with contribution of internal factors such as an atopic status and external factors, such as allergens and irritants. The precise impact of allergic contact dermatitis remains unclear, although patients often suspect an allergy and recently published guidelines stress the importance of patch testing.[4,5]

There are no standard series of patch test allergens in Nepal and our objective in this study is aimed at identifying common allergens responsible for allergic contact dermatitis among hand eczema patients in the general Nepalese population using the Indian Standard baseline series.

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Materials and Methods

Patients

This was a hospital based descriptive study in which all clinically diagnosed cases of hand eczema attending the Dermatology Out Patient Department of B. P.

Koirala Institute of Health Sciences, Dharan over May 2009 - June 2012 and the Out Patient Department July 2012-June 2015, Kathmandu Medical College, constituted the study population.

Other skin diseases involving the hand, such as infective dermatitis, dermatophytide, eczematous drug reactions, psoriasis and cumulative insult dermatitis were excluded by history and clinical examination.

A detailed history of each patient was recorded in the proforma designed for the study which was approved by the institutional review board and the ethical committee.

Patch test

Patch test was done in all patients of hand eczema using the Indian Standard Series of Allergens as approved by the Contact and Occupational Dermatoses Forum of India (CODFI), consisting of 28 allergens

Finn chambers were used and allergens, usually incorporated in petrolatum, were applied in round chambers of inert material (aluminum, polyethylene), which were mounted on adhesive tapes free from colophony.

Patch tests were applied on the upper half of the back after cleaning the area with spirit and the results were recorded at 48 hours and 96 hours.

Statistical analysis

Data was tabulated and interpreted in terms of percentage, mean and standard deviation in the computer using SPSS version 20. To test the significance of association Chi square test was applied.

Results

Total 256 patients with hand eczema were approached. Out of them 195 agreed to participate in the study and took patch testing. Out of 195 patients, 117 were females and remaining 78 were males, for a gender ratio of 1.5:1. The mean age of the respondents was 32 years ± 14.5 years. The age varied within a wide range of 15 years to 70 years. Duration of disease at the time of presentation of respondents was found to range from minimum 1 week to maximum 15 years. Out of 195 cases who had done patch testing, 110 cases (56.4%) showed positive reaction in patch testing to at least one allergen.

Table 1 shows the common positive tested allergens in all patients with hand eczema. The most frequent sensitizer was Nickel sulphate (22.7%). Subsequently, Gentamicin, Fragrance mix, Epoxy resin and Potassium dichromate caused a substantial amount of positive reactions.

Table 2 displays the distribution of positive patch test reaction by sex. Females had more sensitizer for Nickel, and Gentamicin whereas males had more sensitizer for Fragrance mix, Epoxy resin and Potassium dichromate but these were not statistically significant. Overall, the most frequent sensitizer did not deviate between the two study centers.

Table 1: Frequency of positive patch test reactions (n=110)

Allergen	No of Patients (%)	95% Confidence Interval (%)
Nickel sulphate	25 (22.7)	31.1-18.9
Gentamicin	17 (15.5)	22.3-11.7
Fragrance mix	16 (14.5)	21.1-10.9
Epoxy resin	14 (12.7)	18.9-9.1
Potassium dichromate	12 (11.0)	16.6-7.4
Cobalt chloride	8 (7.3)	11.8-4.2
Neomoycin sulphate	3 (2.7)	5.4-0.6
Parabens	3 (2.7)	5.4-0.6
Formaldehyde	2 (1.8)	4.0-0.03
Mercapto mix	3 (2.7)	5.4-0.6
Balsam of peru	3 (2.7)	5.4-0.6
Nitrofurazone	4 (3.6)	6.8-1.2

Table 2: Gender-wise distribution of patch positive cases (n=110)

Allergen	Gender-wise distribution of patch positive cases	
	Male (%)	Female (%)
Nickel sulphate	10 (20.4)	15 (24.6)
Gentamicin	6 (12.2)	11 (18.0)
Fragrance mix	10 (20.4)	6 (9.8)
Epoxy resin	9 (18.4)	5 (8.2)
Potassium dichromate	8 (16.3)	4 (6.6)
Cobalt chloride	2 (4.1)	6 (19.8)
Neomoycin sulphate	1 (2.0)	2 (3.3)
Parabens	1 (2.0)	2 (3.3)
Formaldehyde	0	2 (3.3)
Mercapto mix	1 (2.0)	2 (3.3)
Balsam of peru	0	3 (4.9)
Nitrofurazone	1 (2.0)	3 (4.9).
Total	**49 (44.5)**	**61 (55.5)**

Discussion

An estimated 2-10% of population is likely to develop hand eczema at some point of time during life. In addition, 20-35% of all dermatitis affects the hands. It appears to be the most common occupational skin disease, comprising 9-35% of all occupational disease and up to 80% or more of all occupational contact dermatitis.[7]

The aetiology of hand eczema is a complex combined effect of major causes and other factors, where the degree of influence of each factor is impossible to determine. The most common cause however still appears to be the exogenous cause.

Allergic contact sensitization is known to be influenced by environmental, cultural, occupational, individual, genetic and racial or ethnic factors. Patch Testing has been proven to establish a positive role in identifying the contact allergens in hand eczema patients suspected of having an allergic etiology. Our study showed 110 cases (56.4%) with patch test positivity which is similar to the previous studies found in the literature ranging from 40–70%.[7-12]

Nickel is a well-known sensitizer and various efforts have been made to reduce the number of sensitizations in the general population. Our study found nickel as the most frequent contact sensitizer in 22.7% patients which was comparable to other studies.[12-15] Nickel positivity has shown a female preponderance in our study as reported by Bilcha et al [15] and Bilcha et al [16]. The higher rates of positive patch test reactions for nickel sulfate in females could relate to their ear piercing, cosmetic application and ornament use behavior.

Gentamicin was the next common sensitizer seen in our patients (15.5%) with a similar female preponderance. This could be explained by the setting of the study population where female nurses coming for visits were more frequent and the easy availaibility of the medication for minor skin lesions.

The third, fourth and the fifth common antigen in our study was found to be in fragrance mix in 16 (14.5%), epoxy resin 14 (12.7%) and potassium dichromate in 12 (11.0%) patients respectively with a slightly higher male preponderance. Construction work is one among the most important occupations predisposing to allergic contact dermatitis [17] and is most commonly because of potassium dichromate.[18,19] This is shown in our study by higher rates of positive reactions to potassium dichromate in cement workers and in subjects with hand dermatitis as reported in the literature.[20]

Conclusions

Nickel, Gentamicin, Fragrance mix, Epoxy resin and Potassium dichromate are common sensitizers in patients with Hand eczema in Nepal. Thus, the identification and evaluation of risk factors for the development and persistence of hand eczema are important to prevent the morbidity of patients and to improve their quality of life.

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