

Original Article

Evaluation and pattern of nickel dermatitis in patients with allergic contact dermatitis

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Abstract *Background* Nickel is the most common allergen in allergic contact dermatitis with diverse clinical manifestations.

Objective To evaluate the clinical pattern of nickel dermatitis in our community by patch testing.

Patients and methods 200 patients with clinical suspicion of allergic contact dermatitis of any age and either sex presenting to the department of dermatology, Mayo Hospital, Lahore were enrolled. All were patch tested using European Standard series.

Results 23% patients had nickel sensitivity. Majority were housewives between 20-40 years of age, belonging to urban middle class. Duration of disease ranged from 2 months to 12 years. Previous history of metal allergy was seen in 41% patients. Polysensitivity was noted in 37% cases.

Conclusion Clinical judgment alone maybe misleading in making a correct diagnosis and patch testing with the European Standard Series is worthwhile.

Key words

Nickel, dermatitis

Introduction

Nickel is one of the most common causes of allergic contact dermatitis (ACD), particularly in women.¹ All age groups are affected but the incidence of nickel sensitivity amongst women tends to rise from the age of ten years onwards. In men, nickel dermatitis is predominantly an occupational disease.²⁻⁵ In women, the most common cause of nickel dermatitis is direct contact primarily from jewelry, garments,

wrist watches and the household environment.

Clinically, nickel dermatitis may present as primary or secondary eruption. Primary eruptions appear in the areas of contact only. It may manifest as nummular eczema or it may present as papular eruptions, either diffuse or scattered. Secondary eruptions start shortly after the primary eruptions.⁵

Our previous work on patch testing using European standard series revealed nickel to be the most common allergen, especially in the females.⁶ The present study was conducted to evaluate frequency of nickel

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dermatitis in patients of allergic contact dermatitis and to establish its clinical patterns.

Patients and Methods

Two hundred patients of any age and either sex, presenting with clinically suspected ACD to the Department of Dermatology, Mayo Hospital, Lahore were enrolled in the study. A detailed history with special reference to atopy, metal allergy, type of work performed and exposure to allergens was taken. A thorough clinical examination with special reference to type of cutaneous eruption was carried out. Relevance of patch test result was determined in all cases.

Patch testing was performed with European standard series in all patients on their upper back, using standard chambers observing the principles of patch testing. Results were read after 48, 72 and 120 hours and interpreted according to the *International Contact Dermatitis Research Group (ICDRG)* criteria. The results were interpreted and related in the light of information provided by the patient's history and clinical examination.

Chi-square test and Fisher's exact test were used to compare different proportions and *p*-value to less than 5% was considered significant.

Results

Out of 200 patients of suspected ACD, 46 (23%) showed sensitivity to nickel. Out of these 46 nickel sensitive patients 42 were females and 4 were males. Nickel-sensitive female to male ratio was 10.5:1. The

Table 1 Symptoms (n=46)

<i>Symptoms</i>	<i>n (%)</i>
Itching	40 (86.9)
Burning	26 (56.5)
Pain	10 (21.7)
Tingling	4 (8.7)

Table 2 Sites of involvement (n=46)

<i>Sites</i>	<i>n (%)</i>
Hands & arms	18 (39.1)
Feet & legs	15 (32.6)
Face & neck	10 (21.7)
Chest	1 (2.2)
Generalized	1 (2.2)
No skin lesion	1 (2.2)

Table 3 Polysensitivity with two allergens

<i>Sr. No.</i>	<i>Allergen</i>	<i>n (%)</i>
1.	Potassium dichromate	5 (10.9)
2.	4-phenylenediamine	4 (8.7)
3.	Colophony	3 (6.5)
4.	Neomycin sulphate	2 (4.4)

youngest patient was 9 while the oldest was 88 years old. The majority of patients were in the third decade. Twenty three of nickel-sensitive patients were housewives, 10 were students, 4 belonged to medical services, three were teachers and three were office workers. Average duration of the disease was 3 years and 5 months. Course was continuous in 20%.

A personal or family history of atopy was present in 17 patients. History of metal allergy was given by 19 patients. Other aggravating factors included increased sweating in 16 patients, and wet work and detergents in 5 patients each. Itching (86.9%) and burning (56.5%) were the most common symptoms (**Table 1**). The eczema was acute in 22 patients, chronic in 16 patients and subacute in 8 patients.

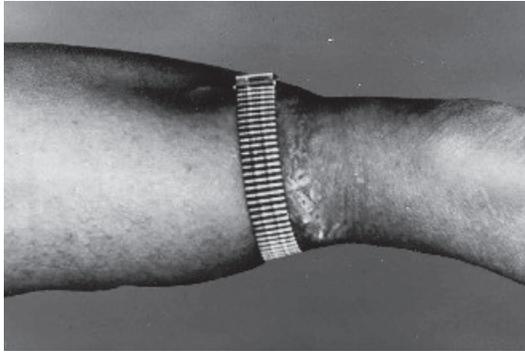


Figure 1 Allergic contact dermatitis due to use of metallic wrist watch.



Figure 2 Eczematous eruption due to metallic frame of eye glasses.



Figure 3 Weeping at the site of earrings containing nickel.

In 18 patients hands and forearms were involved while 15 patients had involvement of feet and legs. Less commonly affected sites are shown in **Table 2**. One patient had no skin lesions but itching only. Polysensitivity was noted in 17 patients. One patient showed sensitivity to four



Figure 4 Features of chronic eczema at the site of contact with metallic pen.

allergens, 2 were sensitive to three allergens and 14 to 2 allergens concomitantly. The two concomitant allergens are depicted in **Table 3**. The results were relevant in 41% patients.

Adverse reactions observed during patch testing included tape erythemas (11 patients), mild itching (6 patients) and severe itching in 3 patients.

Discussion

The frequency of nickel dermatitis was 23%. Nickel sensitivity was more common in females than males. This is in accordance with other studies showing female predominance.¹⁴ The reason for female predominance is the greater degree of exposure to this allergen in jewelry and clothing. Majority of the study population were either housewives, students or teachers suggesting that the nickel exposure occurred from non-occupational sources during routine household work.

Most of the patients were between 21-30 years. It is the most active time of life which exposes both sexes to different allergens. Duration of the disease was more than one year in 65% patients which reinforces the

view that it is a chronic condition. 37% nickel-sensitive patients had history of atopy and 41% had metal allergy whereas 24% had both. Climatic conditions in our country as well as the widespread and uncontrolled exposure to various allergens may be the contributing factors.

Rate of sensitivity to nickel are high in most countries. Females are said to be sensitized in higher numbers because of exposure to artificial jewelry and ear piercing at an early age.⁷ Hand eczema in nickel sensitive patients may be exacerbated by exposure to solid metal or detergents, bleaches and soaps. Family history of atopy was noted in 17 patients (37 %) which is in accordance with another local study on shoe dermatitis patients.⁹ This indicates that atopics and nonatopics both are equally nickel-sensitive.^{8,9}

Relevance of patch testing was seen in 41% patients as reported previously.^{6,9} In the rest it was questionable. The increasing use of nickel in many new household products makes it difficult to trace the source. Polysensitivity was usually seen with potassium dichromate, 4-phenylenediamine, colophony and neomycin sulphate. The co-sensitivity to other allergens appears to be due to exposure to multiple sensitizers.^{6,9}

Conclusion

Our study concludes that nickel dermatitis commonly affects females. Keeping in view the indefinite course of the disease, patch testing is advisable in all patients with chronic hand and foot eczema. It also reinforces the view to use low nickel releasing alloys.

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