

METAL SENSITIVITY IN CHILDREN

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One hundred children were patch tested with 5% nickel sulphate, 0.5% potassium dichromate, 5% cobalt chloride and pure petrolatum. Seventeen children (11 having eczematous and 6 having non-eczematous dermatoses) showed positive patch test reactions to one or more metals, chromium (13%), nickel (8%) and cobalt (1%). The incidence of metal sensitivity was higher (32.5%) in the older children (8-14 years) as compared to the younger children below 7 years of age (2.66%). The female children had a higher incidence of sensitivity as compared to the male children.

Key words : Contact dermatitis, Metals, Children.

Contact dermatitis (CD) among children was considered to be rare till recently when Fisher¹ refuted this old view and stated that CD readily occurs in children. Subsequently, some authors²⁻⁵ carried out similar studies on children and opined that CD was not as rare as it was thought to be. The children may also be sensitized to metals in the same way as adults through the use of artificial jewellery, ear-piercing, wearing apparels (especially shoes), cement, and other industrial or domestic exposures. A few reports on CD are available in the Indian literature⁶⁻¹² but none of them provides information on the prevalence of metal sensitivity in children. In the present study, an attempt was made to find out the prevalence of CD in children to three metals, nickel, chromium and cobalt.

Materials and Methods

One hundred children were included in the study. Of these, 33 were having eczematous dermatoses (atopic dermatitis, CD, dermatitis of hands or foot or both and seborrhoeic dermatitis) and 67 were having non-eczematous dermatoses (scabies, tinea corporis/cruris, pityriasis rosea, impetigo, intertrigo, warts and molluscum contagiosum etc). Children as well as their parents were questioned in detail regard-

ing exposure to commercial products of three metals (wash and wear apparel, jewellery, chrome plated toys and feeding bottles; paper, cosmetics, rubber goods, shoes and cement, etc). The patch test material comprised of 5% nickel sulphate, 0.5% potassium dichromate, and 5% cobalt chloride prepared in petrolatum. Pure petrolatum patch test was also applied as a control in all the patients. The 3 metal antigens and petrolatum were supplied by E Merck (India) Ltd, Bombay. The patch tests were applied and read according to standard procedures.¹²

Results

Of the 100 children, 58 were boys and 42 girls. Their ages ranged between 6 months to 14 years (Tables I and II). Seventeen children (8 boys and 9 girls) showed positive patch tests with different metals, and 4 (2 boys and 2 girls) to petrolatum. The incidence in eczematous and non-eczematous groups was 11 (33.3%) and 6 (8.95%) respectively (Table III). Thirteen children were sensitive to one metal (9 to chromium and 4 to nickel), 3 patients (2 girls and 1 boy) were sensitive to two metals (chromium and nickel), and one was sensitive to all the three metals. The girls had contact dermatitis of the ear-lobes. None of the patients showed sensitivity to cobalt alone. The four children having positive patch tests to petrolatum were 2 girls and 2 boys. Of these, one girl was sensitive to

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Table I. Age and sex incidence of metal sensitivity in children.

Age group	Total number (%) of patients					
	Males		Females		Total number	
	Tested	Positive	Tested	Positive	Tested	Positive
0—7 years	34	2(5.8)	26	2 (7.6)	60	4 (2.6)
8—14 years	24	6(25.0)	16	7(43.7)	40	13(32.5)
Total	58	8(33.7)	42	9(21.4)	100	17(17.0)

Table II. Patch test results with metals in individual patients.

Age and Sex	Diagnosis	Positivity of patch test to			
		Nickel	Chromium	Cobalt	Petrolatum
13 M	Eczema hands	+	+	—	—
12 M	Eczema feet	—	+	—	—
10 F	CD (ear rings)	++	++	+	+
9 F	CD (chain)	++	+	—	+
14 F	Eczema hands	—	+	—	—
11 M	Eczema feet	—	+	—	—
10 M	Dermatitis (spectacles frame)	—	+	—	—
13 F	CD (shoes)	++	++	—	—
14 M	CD (watch strap)	+	—	—	—
7 F	Scabies	—	+	—	—
11 F	Unidentified dermatitis (left thigh)	+	—	—	—
12 F	Pityriasis rosca	+	—	—	—
11 M	Tinea corporis	—	+	—	—
2½ F	Scabies	—	+	—	—
9 F	Unidentified dermatitis buttocks	—	+	—	+
1½ M	Tinea corporis	—	+	—	—
6 M	Intertrigo	+	—	—	+
Total		8	13	1	4

Table III. Metal sensitivity in eczematous and non-eczematous dermatoses.

Metals	Number of patients with a positive patch test in the					
	Eczematous groups			Non-eczematous groups		
	Male	Female	Total	Male	Female	Total
Nickel alone	1	1	2	1	1	2
Chromium alone	3	2	5	2	2	4
Cobalt alone	—	—	—	—	—	—
Nickel and chromium	1	2	3	—	—	—
Nickel, chromium and cobalt	—	1	1	—	—	—
Total	5	6	11	3	3	6

all the three metals, the other girl to two metals and 2 boys to one metal each.

Metal sensitivity was more frequent (32.5%) in the older children as compared to the younger children (2.66%). The sex-wise incidence was a little higher in the female children (21.42%) than the male children (13.78%).

Comments

Dermatologists had been reluctant to patch test children because of fear of getting non-specific irritant reactions, especially to metals.¹³ But now, it is considered that children can be patch tested with the same concentration of allergens as used in adults.^{1,3,5,14} Camarasa et al⁵ observed that sensitivity to metals is not infrequent in children, the clinical diagnosis of CD sensitivity to nickel being 9%, and to chromium and cobalt 4% each. The incidence of metal sensitivity in older children was higher. Similar observations were made by other workers^{1,3,14} also. In our study, chromium sensitivity was higher (13%) as compared to those reported by other workers. It is probable that some children get sensitized through wearing apparels, metals, shoes etc. but the dermatitis had not yet manifested clinically.

The causes of nickel sensitivity in children are mainly the use of artificial jewellery and ear piercing. Nickel is commonly used for polishing (nickel plating) the kitchen utensils, thus to some extent it is also consumed with food. Sensitivity to cobalt was very low (1%), being similar to that observed in western countries. Combined metal sensitivity in our study was found in 4 children (4%) only. Of these 4 children, 3 were sensitive to two metals and the 4th child, a girl of 10 years to all the three metals. She was an atopic child. Camarasa et al,⁵ have reported combined metal sensitivity in 8% of children. Combined metal sensitivities arise because of exposure to the metals from the same source (electroplated jewellery, alloys, cement etc), [and not as a cross reaction.¹⁵

In the present study, petrolatum positivity was observed in four (4%) children only as compared to a high incidence reported by other workers.^{16,17}

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