Dear Editor

Atopic dermatitis (AD) can be divided into two types,1 serum IgE-high extrinsic AD (EAD), occupying approximately 80% of total AD, and serum IgE-normal intrinsic AD (IAD). We have investigated various clinical and immunological aspects of IAD.2,3 A high nickel concentration among the three groups were performed using Kruskal–Wallis test followed by Steel–Dwass’s multiple comparisons post hoc test. Statistical significance was ascertained when P value was less than 0.05.

The patients’ clinical profiles are shown in Table 1. One of male EAD patients claimed to interrupt the subsequent test because of occurrence of palmar dyshidrotic eczema on day 2. One female IAD patient developed facial erythematous lesions on day 3. In these two patients, only the pre-load samples were subjected to nickel measurement. Three of HC agreed to provide only preload serum samples. Total serum IgE levels, SCORAD, and eosinophil percentage were significantly higher in EAD than IAD. There was no significant differences in CCL17/TARC or VAS of pruritus between IAD and EAD. One EAD patient had FLG mutation (S2554X) commonly seen in Japanese AD patients.2

Fig. 1 shows the nickel concentrations in the sera before (Fig. 1A) and after nickel loading (Fig. 1B). The nickel concentration levels (mean ± SD, ng/ml) before loading test were 2.79 ± 1.90 (IAD), 1.43 ± 2.15 (EAD), and 0.40 ± 0.93 (HC), respectively (median: 2.68, 0.41, and 0.00). The IAD patients had significantly higher nickel levels than did the HC subjects (Fig. 1A). The nickel concentration levels were 1.82 ± 2.12 and 0.40 ± 0.93 in AD and HC, respectively (P = 0.02). There was no strong correlation between the nickel concentration and SCORAD, but a weak correlation was observed in EAD (R = 0.52, P = 0.08). After nickel loading, the mean nickel levels were 3.59 ± 0.47 (IAD), 2.05 ± 2.87 (EAD), and 0 ± 0 (HC), respectively, (median: 3.83, 0.67, and 0.00). Thus, the high serum nickel concentration in IAD became more discernible as compared with EAD and HC (Fig. 1B). Significant nickel increment was not found in the post-loading data, although a minimal increase was detectable in the IAD patients.

Our study clearly demonstrated that the serum nickel concentration is constitutionally high in IAD patients compared with EAD and HC individuals. Notably, the nickel concentration was 7.0-fold higher in IAD than HC before nickel loading. Even the nickel patch test-negative IAD patients had high serum nickel levels, suggesting that systemic metal allergy might occur in non-skin
sensitized patients. Nickel and cobalt have the ability to induce allergic reactions by directly stimulating toll-like receptor 4 on antigen presenting cells. Therefore, our finding suggests that serum nickel sensitize circulating T cells and they express skin-homing receptors upon repeated elicitation with serum nickel and migrate to the lesional skin.

Although the post-loading data more clearly showed the high level of nickel concentration in IAD, the dietary nickel loading did not effectively increase the nickel concentration. Thus, the twice excess intake of metal-containing foods does not substantially increase the metal concentration in sera. Our finding provides an implication that the absorption or transport of nickel in IAD patients is abnormally upregulated in a steady state.

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Conflict of interest

The authors have no conflict of interest to declare.

References


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