Methylisothiazolinone: second 'epidemic' of isothiazolinone sensitization

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Isothiazolinones are used as biocides in a wide variety of products, such as cosmetics, detergents, and industrial products. In the 1980s, a formulation with methylchloroisothiazolinone (MCI) and methylisothiazolinone (MI) was responsible for an allergic contact dermatitis 'epidemic'. To control this phenomenon, a maximum allowed dose was set. However in 2005, MI alone was introduced in cosmetics, and this was followed by a new 'epidemic' of sensitization to MI and MCI/MI (1).

We performed a retrospective study, consulting the medical files of patch tested patients reactive to ISs, from 2005 to 2013. MCI/MI was tested at 100 ppm in water (TROLAB® patch test allergens, Almirall Hermal GmbH, Reinbek, Germany) and MI was tested, from May 2012, at 500 ppm in water (0.05%) (TROLAB®

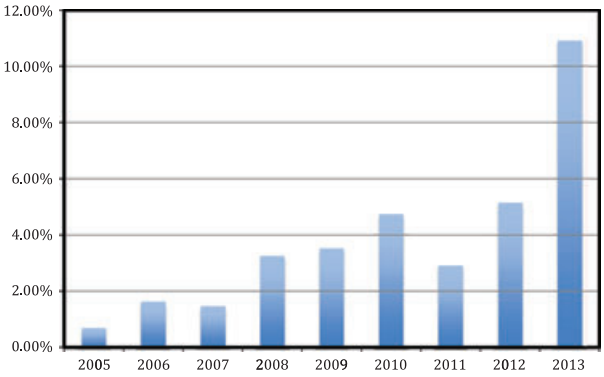

Fig. 1. Positive patch test sensitization to methylchloroisothiazolinone/methylisothiazolinone (MI) or MI, with MI being tested since May 2012.

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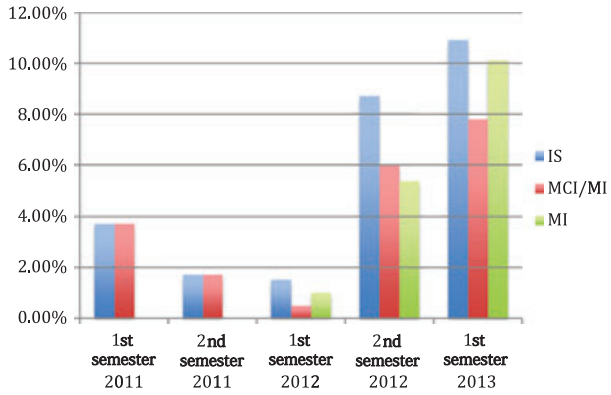

Fig. 2. Positive patch test reactions to methylchloroisothiazolinone (MCI)/methylisothiazolinone (MI) and MI. IS, isothiazolinone.

patch test allergens). Allergens were applied for 48 hr on the back, with Finn Chambers® on Scanpor® tape (Epitest Ltd, Vellinge, Sweden), or IQ Ultra Chambers™ (Chemotechnique, Vellinge, Sweden). The readings were performed on D2 or D3 and D4 or D7.

We observed a significant increase in isothiazolinone sensitization. The prevalence rose from < 1% in 2005 to 3.24% in 2008. After 2012, and with the addition of the MI patch test, the sensitization rates increased to 5.15% in 2012, and doubled to 10.9% in the first half of 2013 (Fig. 1).

After 2011, we observed a total of 35 patients with positive reactions to isothiazolinones, 20% men (n = 7) and 80% women (n = 28), ranging in age from 3 to 72 years. The percentage of patients with an isothiazolinone-positive patch test reaction in the different semesters is shown in Fig. 2. Definitive relevance was established in 33 (94.3%) patients, mostly to cosmetics and occupational activities. Eighteen cases (51.4%) were related to professional activity (6 nurses, 3 hairdressers, a beautician, 5 cleaners or workers who also clean their workplaces, and 2 factory workers). 15/35 (42.9%) patients had a positive patch test reaction to a personal product containing isothiazolinones. To better evaluate the clinical implications of IS sensitization, we contacted by telephone 11 of 20 patients in whom a causal relationship with products that were contacted daily was not positively traced, and 10 reported clinical improvement after avoiding isothiazolinone-containing products. Moreover, 2 hairdressers changed their job because of clinically severe symptomatology.

Discussion

The rate of isothiazolinone sensitization in our population has been increasing consistently since 2005; this increase was more pronounced in 2012, when the MI patch test was introduced. Moreover, we observed 8 of 28 cases reacting exclusively to MI; therefore, this patch test was essential for the diagnosis of isothiazolinone sensitization in 28.6% of patients.

The permitted concentration of MI in Europe should be urgently revised. In an MI-sensitized population, 64% reacted to products containing 50 ppm, whereas only 18% reacted to products containing 5 ppm (2). Definite clarification of the primary sensitizer requires testing with MCI and MI separately (3, 4, 5). However, in our study, the asymmetrical patterns of reactivity to MI and MCI/MI, and the higher intensity of the reactions (usually greater intensity for MI than for MCI/MI), support primary sensitization to MI in numerous cases.

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