Airborne and systemic dermatitis, mimicking atopic dermatitis, caused by methylisothiazolinone in a young child

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The mixture of methylchloroisothiazolinone (MCI) and methylisothiazolinone (MI) has well-known sensitization properties. Recently, in both industrial products and cosmetics, MI alone (CAS 2682-20-4) has been used as an alternative (1).

Case Report

A 4-year-old girl presented with a papular dermatitis affecting her face, including the nasolabial folds and lower eyelids (Fig. 1), followed by generalized skin lesions, accentuated at the knee and elbow folds. She was known to have had mild atopic dermatitis since birth. The skin eruption began shortly after the parents had painted the girl’s bedroom with a water-based wall paint (wall paint Gamma®, Antwerp, Belgium). Despite topical treatment with potent corticosteroids, the rash kept waxing and waning, and only after ~4 weeks did it start to clear, while the girl had continued sleeping in the painted bedroom.

Patch tests were performed with an adapted European baseline series for children (2) on the upper back, and occluded for 2 days. Readings were performed according to International Contact Dermatitis Research Group guidelines. At D4, a + reaction was seen to MCI/MI 0.01% (100 ppm) (Fig. 2). The history revealed an extensive nappy dermatitis 6 months earlier, following the use of Scottex Fresh® moist toilet paper (Kimberly-Clark®, Dallas, TX, USA; manufactured in 2010); the eruption had cleared with topical treatment, and had not recurred after use of the paper had been stopped. The baby wipes used, contained MI but not MCI. Upon request, the manufacturer of the paint informed us that only MI was present, at a concentration of 53 ppm, and not MCI or other isothiazolinones. The parents declined further testing with MI separately.

The child was thus diagnosed with allergic contact dermatitis caused by MI as a primary sensitizer in the wipes, followed by airborne – and partly systemic – dermatitis (presumably by inhalation), the latter mimicking atopic dermatitis, elicited by the wall paint.

Fig. 1. Airborne dermatitis of the face: a diffuse papular dermatitis with accentuation of the nasolabial folds and lower eyelids.
Discussion

Recently, MI alone has frequently been used as a preservative in both industrial products and cosmetics, in the latter being allowed at a concentration up to 100 ppm. After the initial occupational cases (3), several reports on sensitization to MI through the use of cosmetics, including moist baby wipes, started to appear in the literature (4).

Exposure to industrial products such as water-based paints, in which the concentration of MI has not been limited, have led to the elicitation of contact dermatitis — and even primary sensitization — in adults (5, 6).

Moreover, evidence is emerging that MI-containing paints might give rise to MI evaporation several weeks after their use (M. Lundov, personal communication 2012), and this could explain the slow resolution of the skin lesions observed in this case, despite treatment.

Both the wipes and the water-based paint contained only MI, which is therefore considered to be relevant for both eruptions. There was a clear positive patch test reaction to MCI/MI containing 25 ppm of MI, which appears to be an important allergen, with, in some subjects, a low elicitation threshold down to 10 ppm (4).

A Danish report mentioned that nearly all water-based paints in Denmark contain MI, MCI, or benzisothiazoline (6); however, according to information obtained from the manufacturer, this paint and all of the other water-based wall paints that they produce only contain MI.

The present paint contained 53 ppm MI, whereas use concentrations ranging from 100 to 270 ppm in paints have been reported by a Danish group (1).

In conclusion, we present here the first case of severe contact dermatitis caused by MI in a young child; this adds to the evidence in favour of urging authorities to regulate the safe use concentration of MI in both industrial and cosmetic products, to minimize the risk, not only in an occupational context, but also for consumers, including children.

References

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