

CONTACT POINTS

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Identifying the optimal patch test concentration for methylchloroisothiazolinone and methylisothiazolinone

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E. Davies and D. Orton

Contact Dermatitis Investigation Unit,
Department of Dermatology, Amersham
Hospital, Buckinghamshire, UK

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Methylchloroisothiazolinone and methylisothiazolinone (MCI/MI) are heterocyclic organic compounds used as preservatives (biocides) with both antibacterial and antifungal properties. The combination of MCI/MI has long been recognized as a potential sensitizing agent, which is widely used as a preservative in cosmetics and household cleaning products and in industry (Kathon® CG, Euxyl® K100, Legend® MK, Microcide® III or Bio-Perge®).

An ideal patch test concentration should be able to detect as many cases of contact allergy as possible without causing irritant reactions or active sensitisation. The current British Contact Dermatitis Society (BCDS) and European baseline series include testing MCI/MI at 100 parts per million (ppm), but a study from Sweden found a higher allergy detection rate with a 200ppm concentration¹. In the Chemotechnique® (Vellinge, Sweden) hairdressing series it is also used at the 200ppm concentration.

Rates of contact allergy to MCI/MI when it was first introduced as a preservative in the 1980s rose to levels of up 8%². This was thought to be secondary to high concentrations found in leave-on cosmetic products. Since the 1990s, the recommended level for cosmetic leave on and rinse-off products was further limited in the EU to 7.5 and 15 ppm, respectively. However, the elicitation threshold for MCI/MI containing solutions is dem-

onstrated to be very low (< 2 ppm)³ so further monitoring is still necessary. It is now mainly found in rinse-off products. More recent data from Europe suggest prevalence rates of allergy between 1 and 3%⁴.

Methods

Our department carried out a study from January 2005 to December 2007. All patients attending the department for patch testing had the 200 ppm MCI/MI (Chemotechnique Diagnostics, Vellinge, Sweden) concentration applied as standard using Finn Chambers® (Scanpor Epitest Ltd Oy, Tuusula, Finland) and the International Contact Dermatitis Research Group scoring system. At the D2 reading, anyone with a positive patch test reaction had the lower 100 ppm concentration applied. On D4, those patients who had a positive reaction to 200 ppm and those who had a positive reaction to 100 ppm were recorded. Although patients were not routinely brought back for a D5 reading for the 100 ppm concentration, patients were actively contacted by telephone to report any positive reactions. In this manner, we were therefore able to identify any patients with an allergy to MCI/MI who would have potentially have been missed if only the lower concentration had been applied. We also recorded any irritant reactions and noted any cases of active sensitization.

Results

In total, 1524 patients were patch tested in our department over the 3-year period. Of these, 46 (3%) patients had a positive reaction at the D2 reading to 200 ppm MCI/MI. Thirty-five (76%) patients went on to have the 100 ppm MCI/MI applied in addition. At the D4 reading, 19 (54%) patients had a positive reaction to 100 ppm and 16 (46%) had a negative reaction to 100 ppm. There were no

irritant reactions and no cases of active sensitization recorded.

Discussion

Our results demonstrate that patch testing at the 100 ppm concentration alone would have missed 16 (46%) cases of allergic contact dermatitis. Testing at the 200 ppm concentration did not cause any irritant reactions or cases of active sensitization.

The study carried out in Sweden by Farm et al. looked at 918 consecutive eczema patients. All patients had both a 200 and a 100 ppm concentration of MCI/MI applied. Readings were made on D3, and 3.4% of patients had a positive reaction to 200 ppm and 1.7% to 100 ppm, indicating that up to 50% of cases might have been missed if only the lower concentration had been applied. In view of these results, the 200 ppm concentration is routinely used in the Swedish standard series.

Ideally, patch testing with MCI/MI at 200 and 100 ppm would have been performed simultaneously. Theoretically, patch testing initially with 200 ppm concentration, followed by 100 ppm concentration could have resulted in a higher allergy detection rate because the immune system would have been primed. This may be a cause of potential bias in our results, although we did take account of the reactions on D4 by telephone conversations and reviewing the patients where necessary.

Our findings are in keeping with those produced by the Swedish study. In view of these results, we would advocate increasing the test concentration from 100 to 200 ppm in the BCDS baseline series.

References

1. Farm G, Wahlberg J. Isothiazolinones (MCI/MI): 200ppm versus 100ppm in the standard series. *Contact Dermatitis* 1991; 25: 104–107.
2. Fewings J, Menné T. An update of the risk assessment for methylchloroisothiazolinone/methylisothiazolinone (MCI/MI)

- with focus on rinse-off products. *Contact Dermatitis* 2000; 41: 1–13.
3. Zachariae C, Lerbaek A, Mc Namee P M et al. An evaluation of dose/unit area and time as key factors influencing the elicitation capacity of methylchloroisothiazolinone/methylisothiazolinone (MCI/MI) in MCI/MI allergic patients. *Contact Dermatitis* 2006; 55: 160–166.
 4. Wilkinson J D, Shaw S, Anderson K E et al. Monitoring levels of preservative sensitivity in Europe. A 10 year overview (1991 – 2000). *Contact Dermatitis* 2002; 46: 207–210.

Address:

Emily Davies

Contact Dermatitis Investigation Unit

Department of Dermatology

Amersham Hospital

Whielden Street

Amersham

Buckinghamshire HP7 0JD

UK

Tel: +44 1494 734600

Fax: +44 1494 734662

e-mail: emilydavies@doctors.org.uk