Allergic contact dermatitis caused by methylisothiazolinone in hair gel

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Methylisothiazolinone (MI; CAS no. 2682-20-4) has been used alone or in association with methylchloroisothiazolinone (MCI) in the mixture MCI/MI 3:1. The maximum concentration of MI in cosmetics, whether rinse-off or not, is 100 ppm in Europe and in the United States (1). Over the past few years, allergic contact dermatitis caused by MI has reached an epidemic level in Europe (2). We report a series of 4 patients with allergic contact dermatitis of the face and/or the scalp secondary to the use of hair gel containing MI. These cosmetics are often not considered as a cause of allergic reactions.

Patients and Methods

This retrospective study included all patients who presented with facial contact dermatitis resulting from the use of hair gel between October 2014 and March 2015 in the department of dermatology and allergology, Tenon Hospital, Paris. All patients were patch tested with the European baseline series and a cosmetic series [MI alone, 2000 ppm; and MI/MCI, 100 and 200 ppm (Chemotechnique, Vellinge, Sweden)] with readings on day (D)2 and D4, according to ICDRG criteria (3). When possible, the topical products incriminated were also tested with a semi-open test or a repeated open application test (ROAT).

Four non-atopic patients presented with facial dermatitis (Fig. 1) that did not improve despite the avoidance of shampoo and/or facial cosmetics containing MI; positive patch test reactions to MI and MCI/MI were found in all cases. Hair gels were then suspected, because of the persistence of dermatitis despite the avoidance of all previously suspected products. Among these patients, 3 were male and 1 was female; they were aged between 40 and 56 years (mean age, 49.8 years). Examinations and test results are summarized in Table 1.

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Fig. 1. Erythematous and squamous rash of the ear.
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Table 1. Clinical presentations and test results

<table>
<thead>
<tr>
<th>Case</th>
<th>Sex/age (years)</th>
<th>Product used</th>
<th>Duration of disease</th>
<th>Physical examination</th>
<th>Allergologic skin tests (D2 and D4)</th>
<th>Clinical relevance</th>
<th>Evolution after allergen avoidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M/56</td>
<td>Hair gel</td>
<td>4 months</td>
<td>Erythematous and oozing lesions of the forehead and the anterior part of the scalp</td>
<td>Patch tests: MI +++/+, MI/MCI 200 ppm +++/+, Semi-open test hair gel +/+ ROAT hair gel ++ (D1)</td>
<td>MI contained in hair gel</td>
<td>No recurrence</td>
</tr>
<tr>
<td>2</td>
<td>F/50</td>
<td>One standard shampoo, and another shampoo for damaged hair and hair gel</td>
<td>24 months</td>
<td>Erythematous and oedematous lesions of the upper eyelid</td>
<td>Patch tests: MI +++/+, MI/MCI 200 ppm +++/+, All personal products neg. (hair gel was not tested)</td>
<td>MI contained in hair gel</td>
<td>No recurrence</td>
</tr>
<tr>
<td>3</td>
<td>M/53</td>
<td>Hair gel</td>
<td>12 months</td>
<td>Erythematous and lichenified lesions of the neck, scalp margin, and helix (Fig. 1)</td>
<td>Patch tests: MI +++/+, MI/MCI 200 ppm +++/+, and DMDM hydantoin +/+</td>
<td>MI contained in hair gel</td>
<td>Lost to follow-up</td>
</tr>
<tr>
<td>4</td>
<td>M/40</td>
<td>Hair gel</td>
<td>Unknown</td>
<td>Poplar erythematos lesions of the forehead and both sides of the neck</td>
<td>Patch tests: MI +++/++, MI/MCI 200 ppm+++/+++</td>
<td>MI contained in hair gel</td>
<td>No recurrence</td>
</tr>
</tbody>
</table>

F, female; M, male; MCI, methylchloroisothiazolinone; MI, methylisothiazolinone; ROAT, repeated open application test.

Discussion

We report 4 patients presenting with allergic contact dermatitis of the scalp and/or the face caused by MI. These cases are unusual, because their dermatitis was caused by the use of hair gel, and, to our knowledge, this has been rarely observed. In the literature, only 2 cases of allergic contact dermatitis caused by hair gel have been published, and these concerned a polyvinylpyrrolidone/1-triacontene copolymer (4) and diazolidinyl urea (5), respectively.

The diagnosis in our 4 cases was difficult, as none of our patients declared using hair gel until specifically asked. All of them reported using different brands of shampoo or make-up, which did not contain MI, but, according to them, hair gel could not be responsible for their dermatitis, because it was only applied on the hair, and not directly on the skin. Three of our patients were male, which is consistent with the use pattern of hair gel in France.

The hair gels were of three different brands, and all of them contained MI. Patch tests with MI and MI/MCI gave positive results in all of our patients. The semi-open test and the ROAT with hair gel gave positive results in the only patient tested with his hair gel. Unfortunately, we do not know the concentrations of MI in these products.

The prevalence of allergic contact dermatitis caused by MI has increased in Europe over the past few years. Indeed, in Denmark, Schwensen et al. (6) reported a significant increase in the prevalence of allergic contact dermatitis caused by MI, from 1.8% in 2009 to 4.2% in 2012. In France, Hosteing and the REVIDAL-GERDA network reported a significant increase in the frequency of positive patch test reactions to MI, from 1.5% in 2010 to 5.6% in 2012 (7). Positive reactions were clinically relevant in 90% of cases.

de Unamuno (8) noticed that the face was the third most common site involved in allergic contact dermatitis caused by MI/MCI, whereas, in the Belgian patients Aerts et al. (2) reported that the face was the most commonly affected site in allergic contact dermatitis caused by MI.

In summary, we report four cases of facial and scalp allergic contact dermatitis caused by MI in hair gel, which is a very commonly used cosmetic. We would like to emphasize that none of our patients spontaneously reported using hair gel, because, according to them, it could not be the culprit. Clinicians should consider hair gel when evaluating an eczematous rash affecting the face and/or scalp.
References


