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Allergic contact dermatitis to methylisothiazolinone in hair gel

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Summary

Introduction: Over the past few years, allergic contact dermatitis to MI has reached an epidemic level in Europe. We report a series of 4 patients presenting allergic contact dermatitis of the face and/or the scalp secondary to the use of hair gel containing MI.

Patients: This retrospective study included all patients who presented facial contact dermatitis due to hair gel between October 2014 and March 2015. Four non atopic patients (3 male, 1 female) presented facial dermatitis, not improving despite avoidance of shampoo and/or facial cosmetics containing MI, with positive MI and MCI/MI patch test in all cases. Hair gels were secondary suspected because the persistence of contact dermatitis despite the avoidance of all previously suspected products.

Discussion: Allergic contact dermatitis to hair gel has been rarely reported yet in literature. Diagnosis of our cases was difficult since none of our patients reported spontaneously using hair gel. Indeed, according to them, hair gel could not be responsible for contact dermatitis since it was not applied on the skin. Dermatologist and allergologist should think about hair gel when facing an eczematiform rash of the face and/or the scalp.

Key words: allergic contact dermatitis, eczema, methylisothiazolinone, hair gel, cosmetic.
INTRODUCTION
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 authorized 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 to MI has reached an epidemic level in Europe (2). We report a series of 4 patients presenting allergic contact dermatitis of the face and/or the scalp secondary to the use of hair gel containing MI. These cosmetics are not usually known to cause allergic reactions.

PATIENTS AND METHODS
This retrospective study included all patients who presented facial contact dermatitis due to hair gel between October 2014 and March 2015 in the department of dermatology and allergology, Tenon Hospital, Paris. All patients were tested with the European Baseline and Cosmetic Series of patch test (MI alone 2000 ppm and MI/MCI 100 and 200 ppm (Chemotechnique, Vellinge, Sweden) and reading was performed at day 2 (D2) and D4, according to the International Contact Dermatitis Research Group criteria for readings (3). When possible, topical products incriminated were also tested by semi-open test or repeating open application tests (ROAT).

Cases 1 to 4
Four non atopic patients presented facial dermatitis (figure 1), not improving despite avoidance of shampoo and/or facial cosmetics containing MI, with positive MI and MCI/MI patch test in all cases. Hair gels were secondary suspected because the persistence of contact dermatitis despite the avoidance of all previously suspected products, and after having re-examined all patients. Among these patients, 3 were male and 1 was female, they were aged
between 40 and 56 years old (mean age 49.8 years-old). Physical examination and allergologic skin tests were summarized Table 1.

**DISCUSSION**

We report 4 new patients presenting allergic contact dermatitis of the scalp and/or the face due to MI. These cases are original since they are secondary to the use of hair gel, which, to our knowledge, has been rarely reported yet. Indeed, all other publications reported allergic contact dermatitis to MI contained in hair cosmetic, without specifically referring to hair gel. In literature, only two cases of allergic contact dermatitis to hair gel were published: the first case was a 12-year-old boy who presented an inflammatory rash after using a hair gel; patch tests were positive to copolymer PVP/1-triacontene, contained in hair gel (4); the second case was a 42-year-old male who presented a severe acute eczematous rash of the face, ears and neck after using hair gel (5). Patch tests were positive for diazolidinyl urea, contained in hair gel. Semi-open tests were positive for the hair gel.

Besides, diagnosis of our cases was difficult since none of our patients reported spontaneously using hair gel. Indeed, 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 contact dermatitis since it was only applied on hair and not directly on the skin. Three of our patients were male, which is consistent with the usual use of hair gel in France.

Hair gels were of 3 different brands and all of them contained MI. Patch tests for MI and MI/MCI were positive in all our patients. Semi-open test and ROAT with hair gel were positive in the only patient tested with his hair gel. Unfortunately, we do not know the concentration of MI in all of these products.
Prevalence of allergic contact dermatitis to 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 to MI from 1.8% in 2009 to 4.2% in 2012. In France as well, Hosteing and the REVIDAL-GERDA reported a significant increase in the frequency of positive patch test to MI from 1.5% in 2010 to 5.6% in 2012 (7). This positivity was relevant with the clinical history in 90% of cases.

Besides, de Unamuno (8) noticed the face was the third most common site involved in allergic contact dermatitis to MI/MCI whereas, in the Belgian cohort, Aerts et al. (2) reported the face was the most affected site in allergic contact dermatitis to MI.

To conclude, we report four cases of facial and scalp allergic contact dermatitis to MI due to hair gel, a very common cosmetic. We would like to emphasize the fact that none of our patients reported spontaneously using hair gel since, according to them, it could not be the culprit. Dermatologist and allergologist should think about hair gel when facing an eczematiform rash of the face and/or the scalp.
REFERENCES


Table 1: Clinical presentations and results of allergologic skin tests for allergic dermatitis due to contact with methylisothiazolinone. ROAT: Repeated Open Application Tests, F: female, M: male. MI: methylisothiazolinone, MCI: methyl-Chloro-isothiazolinone.

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