

Allergic contact dermatitis caused by glycyrrhetic acid and castor oil

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Case Report

A 19-year-old woman with a past history of eczematous lesions at sites of contact with costume jewellery and adhesive dressings was referred for investigation of repeated episodes of contact dermatitis that occurred over a period of 3 years. The lesions involved the lips, the axillae, and the face. The patient implicated two lip balms, a deodorant, and a post-sun moisturizing cream.

Patch testing was performed in two separate sessions. In August 2008, the patient was first tested with the North American Contact Dermatitis Group baseline series (AllergEAZE™; SmartPractice®, Calgary, Canada) applied on Finn Chambers® (SmartPractice®, Phoenix, AZ, USA), the antimicrobials/vehicles/cosmetics series, and the four suspected cosmetics, applied on IQ Ultra® chambers (Chemotechnique Diagnostics AB, Vellinge, Sweden) (Table 1). The patches were removed at D2, and the reactions were scored according to the criteria of the International Contact Dermatitis Research Group at D2 and D4. The patient's positive reactions to colophonium and nickel sulfate were deemed to be of past relevance.

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Table 1. Patch test results, first session

Allergen	Concentration	D2	D4
Vichy Déodorant Peau Très Sensible	100%	2+	3+
Lancôme Lait Après Soleil	100%	3+	3+
Lipolèvres	100%	2+	—
Labello® NIVEA Med Protection Lip Balm	100%	—	2+
Benzalkonium chloride	0.1% aqua	2+	2+
Colophonium	20% pet.	—	1+
Nickel sulfate	2.5% pet.	—	1+

Table 2. Patch test results, second session

Allergen		D2	D4
<i>Ricinus communis</i> seed oil (Labello® NIVEA)	5% liq. par.	2+	2+
<i>Ricinus communis</i> oil (Lipolèvres)	100%	2+	2+
Glycyrrhetic acid (Vichy Déodorant)	0.02% aq./alc.	2+	2+
Glycyrrhetic acid (Lancôme Après Soleil)	0.2% aq./alc.	1+	1+

liq. par., liquid paraffin; aq./alc., 50% aqua + 50% alcohol.

She had strong reactions to each of her four cosmetics, none of which contained benzalkonium chloride. The relevance of this last reaction remained undetermined (Table 1).

The manufacturers of the cosmetics provided their separate ingredients, and a second session of patch testing took place in June 2010 (Table 2). Positive reactions

were seen to *Ricinus communis* seed oil, present in Labello® NIVEA Med Protection Lip Balm (Beiersdorf AG, Hamburg, Germany) and Lipolèvres lip protector (La Roche-Posay Laboratoire Dermatologique, La Roche-Posay, France), and to glycyrrhetic acid, an ingredient common to Lait Après Soleil (Lancôme, Paris, France) and to Déodorant Peau Très Sensible (Laboratoires Vichy, Vichy, France).

Discussion

The oil extracted from the seeds of *R. communis*, or the castor oil plant, is used in most lipsticks as a humectant and pigment stabilizer. Its main fatty acid is ricinoleic acid, and allergic contact dermatitis caused by it and its derivatives, although rare, has been repeatedly reported (1–4).

Glycyrrhetic acid, or enoxolone, is a pentacyclic triterpene derived from the hydrolysis of glycyrrhizic acid (glycyrrhizin), one of the main components of licorice root, or *Glycyrrhiza glabra*. Because of its steroid-like chemical structure, it possesses anti-inflammatory activity, as well as antibacterial, antiviral and antifungal activities. In a mouse model of allergic contact dermatitis, glycyrrhetic acid showed weak inhibitory activity (5). As an ingredient in Atopiclair® (Graceway Pharmaceuticals, Bristol, TN, USA) it is used for its anti-inflammatory and antipruritic effects in the treatment of atopic dermatitis (6).

Allergic contact dermatitis caused by glycyrrhetic acid appears to be extremely rare, as we could find only three previous reports (7–9). One publication describes delayed facial angioedema following oral ingestion (10), and another mentions allergic contact dermatitis caused

by glycyrrhizin in a topical hair-restoring preparation (11).

Our patient's reactions to *R. communis* and to glycyrrhetic acid represent concomitant reactions, as the two molecules have completely different chemical structures (Fig. 1). Her weaker reaction to the higher concentration of glycyrrhetic acid may be explained on the basis of its anti-inflammatory effect, as seen when testing with topical glucocorticosteroids (12). Given the recent increase in the use of glycyrrhetic acid in cosmetics and therapeutic adjuncts, we expect to see more cases of allergic contact dermatitis in the future.

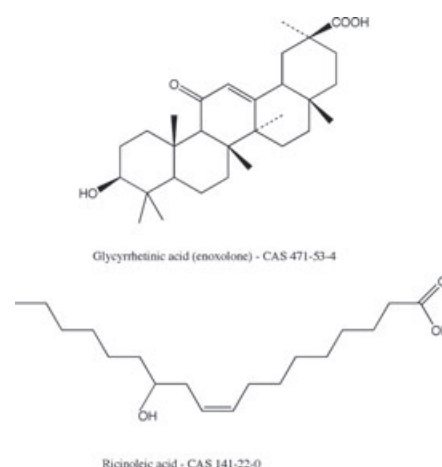


Fig. 1. Chemical structures of glycyrrhretinic acid and ricinoleic acid.

References

- 1 Le Coz C J, Ball C. Recurrent allergic contact dermatitis and cheilitis due to castor oil. *Contact Dermatitis* 2000; **42**: 114–115.
- 2 Sowa J, Suzuki K, Tsuruta K et al. Allergic contact dermatitis from propylene glycol ricinoleate in a lipstick. *Contact Dermatitis* 2003; **48**: 228–229.
- 3 Leow Y H, Tan S H, Ng S K. Pigmented contact cheilitis from ricinoleic acid in lipsticks. *Contact Dermatitis* 2003; **49**: 48–49.
- 4 Magerl A, Heiss R, Frosch P J. Allergic contact dermatitis from zinc ricinoleate in a deodorant and glyceryl ricinoleate in a lipstick. *Contact Dermatitis* 2001; **44**: 119–121.
- 5 Park H Y, Park S H, Yoon H K et al. Anti-allergic activity of 18b-glycyrrhetic acid-3-O-b-D-glucuronide. *Arch Pharm Res* 2004; **27**: 57–60.
- 6 Veraldi S, De Micheli P, Schianchi R, Lunardon L. Treatment of pruritus in mild-to-moderate atopic dermatitis with a topical non-steroidal agent. *J Drugs Dermatol* 2009; **8**: 537–539.
- 7 Fernández J C, Gamboa P, Jáuregui I et al. Concomitant sensitization to enoxolone and mafenide in a topical medicament. *Contact Dermatitis* 1992; **27**: 262.
- 8 Tanaka S, Otsuki T, Matsumoto Y et al. Allergic contact dermatitis from enoxolone. *Contact Dermatitis* 2001; **44**: 192.
- 9 Oiso N, Ota T, Yoshinaga E et al. Allergic contact dermatitis mimicking atopic dermatitis due to enoxolone in a topical medicament. *Contact Dermatitis* 2006; **54**: 351.
- 10 Villas-Martinez F, Joral Badas A, Garmendia Goitia J F, Aguirre I. Sensitization to oral enoxolone. *Contact Dermatitis* 1994; **30**: 124.
- 11 Cabrita S F, Silva R, Correia M P. Allergic contact dermatitis due to glycyrrhizic acid as an ingredient of a hair restorer. *Contact Dermatitis* 2003; **49**: 46.
- 12 Isaksson M, Bruze M, Björkner B et al. The benefit of patch testing with a corticosteroid at a low concentration. *Am J Contact Dermat* 1999; **10**: 31–33.