Allergic Contact Dermatitis due to Cinnamon Oil in Galenic Vaginal Suppositories

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Sir,

Medicaments containing various botanical extracts (e.g. tea tree oil, aloe, calendula, Echinacea, propolis) with purported therapeutic benefits are used widely by patients, who often prefer alternative medicine to traditional topical and systemic pharmacological treatments. Numerous over-the-counter herbal-based products are available.

We report here an unusual case of allergic contact dermatitis in a young woman following topical use of galenic vaginal suppositories containing natural substances.

CASE REPORT

An 18-year-old girl developed two symmetrical erythemato-oedematous patches on the glutei, leading to an acute eczema. Erythematous vulvitis and thick leucorrhoea were also present.

In order to treat a persistent vulvar itch that had been present for the past weeks, the patient had used Kolorex® cream and galenic vaginal suppositories. The phytotherapic topical medicament (Kolorex® cream, Named S.r.l., Lesmo, Italy) contained tea tree oil (*Melaleuca alternifolia*), *Aloe barbadensis* and *Pseudowintera colorata* extract. The galenic vaginal suppositories contained tea tree oil (2%) and cinnamon oil (3%). The patient had used both products previously. She had no history of atopy.

After 4–5 days, the patient's vulvitis worsened and an acute pruritic eczematous eruption developed on her buttocks (Fig. 1). Allergic contact dermatitis was suspected and use of the two ointments was suspended. The dermatitis healed following treatment with oral antihistamines, systemic and topical steroids.

Patch tests with the Italian standard SIDAPA (Società Italiana di Dermatologia Allergologica Professionale e Ambientale (Italian society of allergologic occupational and environmental dermatology); www.sidapa.org) series were performed using standardized allergens (FIRMA Spa, Firenze, Italy) with a positive result for fragrance mix 8% pet (++D2/+++D3). This positive reaction was considered relevant for the dermatitis, as these substances were present in topical products used by the patient.

Fig. 1. Allergic contact dermatitis to vaginal suppositories, due to their spreading when the patient laid down in bed.

The Kolorex® cream and galenic vaginal suppositories were also tested in single application occlusive patch tests. A strong positive reaction to vaginal suppositories (++D2/+++D3) was observed, whereas the patch test with Kolorex® cream was negative.

Patch tests were performed with the components of the galenic vaginal suppositories, kindly provided by the manufacturer. These tests revealed positive reactions only to cinnamon oil 3% pet (++D2/++D3) and 1% pet (+D2/+D3), but not at lower concentrations (0.5% pet) (Table I).

Patch tests performed with cinnamon oil at concentrations of 3% and 1% and with fragrance mix 8% pet in 10 controls did not elicit any reaction.

Further patch tests were carried out, using standardized products (FIRMA Spa, Firenze, Italy), with the separate fragrances of the mix previously tested and the main constituents of cinnamon oil. Among 10 substances tested, only cinnamic alcohol at 5% pet gave a positive reaction (+D2/++D3), whereas patch tests with cinnamaldehyde, cinnamic acid and eugenol were negative (Table I).

Allergic contact dermatitis to cinnamon oil containing cinnamic alcohol was therefore diagnosed. The localization of two symmetrical eczematous patches on the patient's buttocks can

Table I. *Patch test results on days 2 and 3, respectively*

	Day 2	Day 3
Standard Italian series		
Fragrance mix 8% pet	++	+++
Balsam Peru 25% pet	–	–
Patient's own medicaments		
Galenic vaginal suppositories, as is	++	+++
Kolorex® cream, as is	–	–
Constituents of galenic vaginal suppositories		
Tween 80, 5% pet	–	–
Tea tree oil, 5% pet	–	–
Cinnamon oil 3% pet	+	++
Cinnamon oil 1% pet	+	+
Cinnamon oil 0.5% pet	–	–
Tea tree oil 2% pet	–	–
Gelatinoid vehicle, as is	–	–
Specific fragrance series		
Cinnamic acid, 5% pet	–	–
Benzyl alcohol, 5% pet	–	–
Cinnamaldehyde, 2% pet	–	–
Eugenol, 5% pet	–	–
Cinnamic alcohol, 5% pet	+	++
Hydroxycitronellal, 5% pet	–	–
Isoeugenol, 5% pet	–	–
Oakmoss absolute, 2% pet	–	–
Vanillin, 10% pet	–	–
Amylcinnamaldehyde, 2% pet	–	–

pet: in petrolatum

be explained by spreading of the vaginal suppositories when she laid down in bed, after an evening application (Fig. 1).

DISCUSSION

Cinnamon is an ancient oriental spice obtained from one of *Lauraceae* trees (*Cinnamomum verum* or *zeylanicum*). It is widely used in the food, in cosmetics and as a natural remedy due to its anti-microbial and fungicidal properties (1, 2).

Cinnamon oil (usually diluted at 0.5–2.5%) is more often derived from the bark than from the leaves of the tree. Its main components are cinnamaldehyde (65–80%), trans-cinnamic acid (5–10%) and eugenol (4–10%); other constituents include cinnamic alcohol, terpenes such as limonene, tannins, mucilages, oligomer procyanidin and traces of coumarin (2, 3).

Irritant and allergic reactions of the skin and mucous membranes have been reported. Cross-reactivity with balsam of Peru is possible (3, 4).

Among the main components of cinnamon oil tested, only cinnamic alcohol, but not cinnamaldehyde, gave an allergic reaction in our patient. Cinnamaldehyde is generally recognized as having a higher sensitization potential than cinnamic alcohol (5–8); nevertheless, according to some reports (9, 10), sensitivity to cinnamic alcohol is similarly or even more frequent than to cinnamaldehyde, because of higher exposure. Thus, the industry guidelines state that the content of cinnamic alcohol should not exceed 4%, whereas they do not restrict the use of cinnamic aldehyde (6).

It has been hypothesized that cinnamic alcohol is a "prohapten" and, owing to metabolic activation, it is transformed into the "true hapten" cinnamaldehyde in the skin (6, 7, 11).

There is a certain cross-reactivity between cinnamic alcohol, cinnamaldehyde and cinnamic acid, depending on skin absorption kinetics, cutaneous enzymatic metabolism and unexplained inter-individual differences (7).

Cinnamic alcohol, separately tested at 5%, is also a component of:

- fragrance mix (at 1%), which resulted in a positive patch test in our patient
- balsam of Peru (at 0.4%), which resulted in a negative patch test in our case. This negative reaction can probably be explained by the very low concentration of cinnamic alcohol (12).

This report, in addition to another report describing allergic contact vulvitis due to the same topical medicament as used by our patient (Kolorex® cream) (13), is an example of how the use of botanical extracts can lead to an increase in allergic reactions. In conclusion, all natural remedies must be regarded as possible allergens, which may result in emerging and not negligible dermatological problems.

The authors declare no conflict of interest.

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