

Comparison of simultaneous patch testing with parthenolide and sesquiterpene lactone mix

E. ORION¹, E. PAULSEN², K. E. ANDERSEN² AND T. MENNÉ³

¹Department of Dermatology, Tel-Aviv Medical Center, 6 Weitzman st., Tel-Aviv, Israel

²Department of Dermatology, Odense University Hospital, DK-5000 Odense C, Denmark

³Department of Dermatology, Gentofte Hospital, University of Copenhagen, Denmark

Several studies have pointed out that the sesquiterpene lactone (SL) mix is a safe, though inadequate, screen for Compositae allergy. To test the usefulness of the sesquiterpene lactone parthenolide as a supplementary Compositae screening test to the mix, both were included in the standard series in 2 Danish dermatology departments. Among 2244 patients tested, 46 (2%) were positive to SL mix and 73–75% of these were positive to parthenolide. The results demonstrate that parthenolide is not suitable as a supplementary screening agent to SL mix, but may be a fairly good screen on its own if the mix is not available.

Key words: allergic contact dermatitis; patch testing technique; plants; Compositae; parthenolide; sesquiterpene lactone mix. © Munksgaard, 1998.

Accepted for publication 11 December 1997

The allergens responsible for Compositae dermatitis are sesquiterpene lactones (SL), which consist of a lactone ring combined with a sesquiterpene skeleton (1). The sesquiterpene lactone mix used for patch testing in the European standard series consists of a mixture of 3 lactones with different sesquiterpene skeletons: alantolactone (an eudesmanolide), costunolide (a germacranolide) and dehydrocostus lactone (a guaianolide) (2). This SL mix, in 0.1% concentration, is used for screening of SL contact allergy, with positive results in 1.4%–1.8% on routine patch testing (2, 3).

Previous studies from Denmark, however, have shown a higher detection rate of Compositae sensitivity when the SL mix was supplemented with the Compositae mix (4–6). Based on testing with the constituents of the latter, the parthenolide-containing feverfew extract was considered to be one of the most important ingredients. At the same time, costunolide of the SL mix yielded few positive reactions compared to alantolactone and dehydrocostus lactone (4), and it therefore seemed advisable to supplement the SL mix with the commercially available parthenolide, which has a germacranolide structure (7).

The objective of this study was to assess the efficacy of parthenolide 0.1% pet. as a supplementary Compositae allergy screening test to the SL mix used today.

Materials and Methods

Gentofte. Between July 1996 and October 1997, 955 consecutive patients were patch tested with sesquiterpene lactone mix 0.1% pet. (Hermal, Hamburg) (as part of the European standard series), and with parthenolide 0.1% pet., using Finn Chambers on Scanpor tape.

Odense. From January 1995 to October 1997, 1289 consecutive patients were patch tested with SL mix 0.1% pet. and with parthenolide 0.1% pet., using Finn Chambers on Scanpor tape.

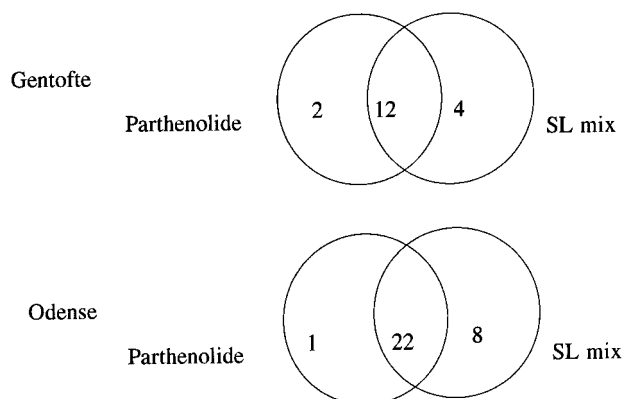


Fig. 1. Number of patients with positive allergic reactions to SL mix 0.1% and parthenolide.

Table 1. Allergic (+, ++, +++) and doubtful (?+) reactions to SL mix 0.1% and parthenolide 0.1% in Gentofte and Odense (results from Odense are in *italics*)

	D 2	D 3-4	D 5-7
SL mix 0.1%:			
Allergic reactions	8	15	14
Doubtful reactions	2	25	24
Doubtful reactions	5	5	2
Parthenolide 0.1%:	5	12	13
Allergic reactions	2	21	18
Doubtful reactions	3	3	1
Doubtful reactions	9	14	4

Readings were performed at day(D) 2 (occasionally), D 3-4, and D 5-7, according to the scale recommended by the ICDRG.

Results

Gentofte. 16 patients (1.67%) showed allergic reactions (+/++) to SL mix, and 14 (1.46%) to parthenolide 0.1%. Among the 16 patients with allergic reactions to SL mix, 12 (75%) also reacted to parthenolide, while 4 reacted to SL mix only, and 2 to parthenolide only (Fig. 1). Most positive reactions were recorded on D 3-7 (Table 1). There was 1 case of active sensitization to the SL mix, but none to parthenolide. 14 patients had doubtful reactions (?+) (9 to SL mix and 5 to parthenolide). The majority of these reactions occurred on D 2-4, contrary to the true positive reactions (Table 1).

Odense. 30 patients (2.3%) were positive to the SL mix and 23 (1.8%) to parthenolide. 22 patients (73%) were positive to both screening agents, whereas 8 were positive to the SL mix only and 1 to parthenolide only (Fig. 1). 47 persons had doubtful reactions to the SL mix and 24 to parthenolide. The true positive reactions tended to persist at the 2nd reading on D 5-7, contrary to the doubtful reactions (Table 1).

Discussion

SL mix 0.1% is considered a safe, though not optimal, screen for sesquiterpene lactone allergy, with

low risks of irritation or active sensitization (2, 6). We report the 1st case of active sensitization to SL mix 0.1%. None of the patients developed active sensitization from parthenolide 0.1%.

1.67% and 2.3% positive reactions to SL mix are on a par with, or higher than, previous data (2, 3). The results from both clinics emphasize that parthenolide is not suitable as a supplementary screening agent to the SL mix, since it picks up only a few patients on its own. However, if the SL mix is not available, parthenolide is a fairly good screening allergen that will detect about 75% of the cases positive to the SL mix.

References

1. Paulsen E. Compositae dermatitis. A survey. *Contact Dermatitis* 1992; 26: 76-86.
2. Ducombs G, Benezra C, Talaga P, Andersen K E, Burrows D, Camarasa J G, Dooms-Goossens A, Frosch P J, Lachapelle J-M, Menné T, Rycroft R J G, White I R, Shaw S, Wilkinson J D. Patch testing with the "sesquiterpene lactone mix": a marker for contact allergy to Compositae and other sesquiterpene-lactone-containing plants. *Contact Dermatitis* 1990; 22: 249-252.
3. Ross J S, Du Peloux Menagé H, Hawk J L M, White I R. Sesquiterpene lactone contact sensitivity: clinical patterns of Compositae dermatitis and relationship to chronic atopic dermatitis. *Contact Dermatitis* 1993; 29: 84-87.
4. Paulsen E. *Compositae-dermatitis på Fyn* (PhD dissertation). Odense University: 1996.
5. Hausen B M. A 6-year experience with Compositae mix. *Am J Cont Derm* 1996; 7: 94-99.
6. Paulsen E, Andersen K E, Hausen B M. Compositae dermatitis in a Danish dermatology department in one year (I). Results of routine patch testing with the sesquiterpene lactone mix supplemented with aimed patch testing with extracts and sesquiterpene lactones of Compositae plants. *Contact Dermatitis* 1993; 29: 6-10.
7. Benezra C, Epstein W L. Molecular recognition patterns of sesquiterpene lactones in Costus-sensitive patients. *Contact Dermatitis* 1986; 15: 223-230.

Address:

Klaus E. Andersen
Department of Dermatology
Odense University Hospital
DK-5000 Odense
Denmark