

Oral ingestion of dandelion juice for vesicular hand eczema: Treatment or challenge?

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Dandelion (*Taraxacum officinale* (L.) Weber ex F.H.Wigg.), which belongs to the genus *Taraxacum* of the Compositae/Asteraceae family of plants, has an almost worldwide distribution and is one of the most well-known weeds from this family. Different species of *Taraxacum* have been used in traditional Chinese and Ayurvedic medicine for more than 2000 years, and in Western medicine for at least 1000 years, for an array of diseases.¹ Older reports as well as newer experimental and clinical studies suggest that the leaves may have a diuretic and the roots a choleric effect.^{1,2}

In his review of phytotherapy in dermatology, Dattner described a disease-controlling effect on dyshidrotic eczema, which was allegedly related to smoking cigarettes, in a patient who ingested dandelion tincture on a regular basis.³ Based on these findings, a pilot study of the effect of dandelion juice on vesicular hand eczema was undertaken.

1 | PATIENTS, MATERIALS, AND METHODS

Adults with vesicular hand eczema of at least 1 year's duration and negative patch test reactions to all Compositae allergens in the baseline series within the last 3 years were invited to participate in the study. The severity of the hand eczema was assessed, among other things, with the Hand ECzema Severity Index (HECSI) score.⁴ Based on information from the European Scientific Cooperative on Phytotherapy,⁵ the participants were asked to drink 10 mL of organic dandelion juice twice daily for 20–30 days. The dandelion juice, made

from fresh leaves and root of *Taraxacum officinale* (L.) Weber ex F.H. Wigg., is marketed as a dietary supplement in Denmark.

In addition to known Compositae contact allergy, exclusion criteria included pregnancy, lactation, and use of systemic corticosteroids and/or other immunosuppressive drugs within the last 3 months, as well as liver disease. The study was approved by the regional ethics committee (Study ID S-20070010). One of the participants was patch tested, using Finn Chambers on Scanpor (SmartPractice, Phoenix, Arizona) applied to the back for 2 days with readings on day (D)3 and D7, according to ESCD recommendations.⁶

2 | RESULTS

Three participants completed the study: a 27-year-old woman with localized hand eczema and a HECSI score of 3 at the first and last visit, a 57-year-old woman with HECSI scores of 82 and 42, and a 44-year-old woman with HECSI scores of 32 and 28 at the first and last visit, respectively. None of the participants had clinically significant improvement of their hand eczema at the end of the study period. None of them were recorded as smokers.

A fourth participant, a 43-year-old woman, discontinued the treatment after 1 week because of exacerbation of the hand eczema and slight diarrhoea, ascribed to ingestion of dandelion juice. To rule out contact sensitization to dandelion, the participant was patch tested with dandelion extract 2.5% pet. and undiluted dandelion juice as well as dandelion juice diluted to 50%, 10%, and 1% aq. The undiluted dandelion juice was applied on D3, and after 4 days, a doubtful positive reaction with infiltration at the margins was recorded. The other tests were negative. Patch testing with undiluted dandelion juice was negative in four consecutive controls, but positive in one patient who turned out to be Compositae-sensitive with

The pilot study "Dandelion juice in the treatment of dyshidrotic hand eczema" has been registered in ClinicalTrials.gov (identifier NCT00442091).

positive patch test reactions to the sesquiterpene lactone mix, Compositae mix 2.5% and 5% pet., and dandelion extract 2.5% pet.

3 | DISCUSSION

The results do not suggest any clinically relevant effect of dandelion juice on the course of vesicular hand eczema. However, the duration of the treatment period was relatively short, and furthermore, the dosage of dandelion juice may have been too low: The manufacturer suggested 20 mL twice daily rather than the 10 mL administered here. In the original case report, the patient could control hand eczema by regular ingestion of a dandelion tincture made from root and leaves, and it is thus possible that the tincture was ingested between exacerbations of hand eczema and that the effect was preventive rather than curative.³ Furthermore, the effect may be better in smokers.

The unexpected worsening of hand eczema in the fourth participant, leading to discontinuation of therapy after 1 week, may represent random fluctuations in disease activity. On the other hand, the weak patch test reaction to the undiluted dandelion juice in this participant, combined with negative reactions in four controls and positive reactions to dandelion juice, dandelion extract 2.5% pet., and sesquiterpene lactone mix in a Compositae-sensitive control, may suggest either weak/incipient sensitization to sesquiterpene lactones or sensitization to allergens other than sesquiterpene lactones, which may have induced a systemic allergic reaction. At a previous patch test session, the participant with the doubtful positive reaction to dandelion juice had positive patch test reactions to nickel 200 µg/cm², limonene 1% pet., and a tomato plant extract 10% ethanol⁷ and a doubtful positive reaction to lettuce stem wetted with water, but negative when wetted with ethanol. Common constituents in dandelion (*T. officinale*) root, root and herb, and leaves and tomato plants are phenolic compounds, including hydroxycinnamic acid derivatives such as chlorogenic, caffeic, and ferulic acids.^{8,9} Ferulic acid, although detected in minute amounts in the leaf extract of two Mexican tomato cultivars studied, has been reported as a contact allergen in propolis.^{9,10} Chlorogenic acid has been incriminated as a cause of immediate hypersensitivity, but not contact allergy according to the literature.¹¹

The genera *Taraxacum* and *Lactuca* both belong to the subfamily Cichorioideae, tribe Lactuceae. Based on the results in the control patient, who was allergic to Compositae, the dandelion juice most probably contains sesquiterpene lactones, and another possible explanation of the reaction in the fourth patient is that she had a weak/incipient sensitization to either related sesquiterpene lactones or other compounds found both in dandelion and lettuce latex.

In conclusion, herbal remedies and herbal dietary supplements typically contain many different plant compounds that may have

synergistic, beneficial effects. However, in patients with allergic contact dermatitis in response to plants, there is a risk of unexpected side effects to such remedies and supplements because of cross-reactivity between similar or closely related compounds in different plant families, exemplified by the possible cross-reactivity between tomato plant extract and/or lettuce latex and dandelion juice. It may not always be enough to warn against a particular plant family.

CONFLICT OF INTEREST

None to declare.

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