

Occupational Allergic Contact Dermatitis Caused by the Extracts of Crude Drugs

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Abstract

A 29-year-old female, an aesthetician, developed occupational allergic contact dermatitis caused by extracts of crude drugs. The results of 48-hour closed patch testing showed positive reactions to the moisturizing cream and oil that she used in her work. This cream and oil included *Scutellaria Baicalensis*, mugwort (*Artemisia vulgaris*), and *Artemisia capillaris*, *Gardenia*. The results of patch testing using extracts of the cream and oil showed positive reactions. The extracts of these plants are common and are often used for cosmetics and medicines. This is a rare case of allergic contact dermatitis as an occupational disease.

Keywords: Occupational dermatoses; Allergy; Contact dermatitis; Crude drug; *Scutellaria*; *Artemisia*

Introduction

Aestheticians use a variety of products including fragrances, crude drugs and vitamins. To achieve moisturizing, anti-inflammatory, anti-aging and whitening effects, aestheticians use creams that include extracts of crude drugs, fragrances and herbs. They work with their bare hands, and when the skin barrier is broken, they often develop dermatitis. These ingredients often cause dermatoses or adverse effects. Dermatitis of the hands is one causative factor of contact dermatitis [1]. To prevent occupational dermatoses, it is important to avoid allergens and manage hand eczema. Many occupational dermatoses have been reported, and most of these were cases of irritant dermatitis [2-4]. Here, we report a case of occupational delayed-type allergic contact dermatitis in an aesthetician due to the extracts of plant-based crude drugs.

Case

A 29-year-old female, who worked as an aesthetician beginning in 2010, developed erythema and xerotic skin on her hands 10 months ago. She has used moisturizing cream. Her skin symptoms did not improve as a result of using only steroid ointment, but her skin condition improved during a leave of absence from her work. Upon our first examination, her cutaneous condition involved erythema with itching on her hands (Figure 1). Our first diagnosis was contact dermatitis due to exposure to products or moisturizing cream at her job.



Figure 1: Clinical findings of hands

The results of 48 hours of closed patch testing (The International Contact Dermatitis Research Group criteria) showed positive reactions to the moisturizing cream and oil that she used in her work. The results of patch testing using extracts of cream, oil and standard allergens showed positive reactions to *Scutellaria baicalensis*, mugwort (*Artemisia vulgaris*), *Artemisia capillaris*, *Gardenia* and an extract of mixed plants (Wogonin, *Artemisia capillaris*, *Calendula officinalis*, *Tilia cordata*, *Centaurea cyanus*, and *Anthemis nobilis*) (Table 1).

Table 1: The results of patch testing.

1. We evaluated the results using ICDRG criteria.
2. The extract of mixed plants were Wogonin, *Artemisia capillaris officinalis*, *Tilia cordata*, *Centaurea cyanus*, *Anthemis nobilis*.

Materials	48hr	72hr
<i>Scutellaria Baicalensis</i> 5%	-	+
<i>Scutellaria Baicalensis</i> 1%	-	+
<i>mugwort (Artemisia vulgaris)</i> 5%	-	+
<i>mugwort (Artemisia vulgaris)</i> 1%	-	+
<i>Artemisia capillaris</i> 5%	-	+
<i>Artemisia capillaris</i> 1%	-	+
<i>Gardenia</i> 5%	+	+
<i>Gardenia</i> 1%	-	+
<i>mixed plants</i> 5%	+	+
<i>mixed plants</i> 1%	+	+
<i>distilled water</i>	-	-

Discussion

Aestheticians use various kinds of cream or oil in their work. The purpose of the creams and oils might be to achieve moisturizing, anti-inflammatory, anti-aging or whitening effects. To achieve these effects, crude drugs, fragrances and herbs are often included, but these ingredients can cause dermatoses or adverse effects. The cream that this patient used included some crude drug extracts. They contained some plant components, namely *Scutellaria baicalensis*, Mugwort, *Artemisia capillaris* and *Gardenia*. The extracts of these plants are common and are often used in cosmetics and medicines.

Scutellaria baicalensis Georg belongs to the Lamiaceae family. This plant is indigenous to East Asian countries and the Russian Federation and has been grown in various European countries [5,6]. In China, people have used the dried root of this plant for more than 2000 years as a traditional medicine. *Scutellaria* includes wogonin (WG; 5,7-dihydroxy-8-methoxyflavone), which shows inhibitory activity on the viability and growth of tumor cells[7] and which is a potent inducer of apoptosis in cancer cells [8].

Artemisia arborescens L. ("arborescent mugwort", "great mugwort") is morphologically variable. *Artemisia* plants exist in Asia, Europe and North America [9]. Many essential oils made from *Artemisia* are used in medicines and cosmetics[10,11]. *Artemisia* species are used in traditional medicine for

We recommended her not to use products, oil and cream that showed a positive test result, and she was treated with steroid ointment and anti-histamine tablets. Her dermatitis improved completely, and she can continue to work as an aesthetician using allergen- and fragrance-free oil and cream.

upper airway diseases, hepatitis, cancer and infections [12]. Essential oils or some of their components are used in perfumes and make-up products, in sanitary products, in dentistry, and as food preservatives and additives [13].

Artemisia and Mugwort belong to the Compositae family, which possesses more 1,350 sesquiterpene lactones [14,15]. An arfa-methylene γ -butyrolactone ring was identified as a main allergen in the sesquiterpene lactones of the Compositae family [15-17]. Compositae species are planted globally, and many products used in daily life include sesquiterpene lactones. People with an *Artemisia* allergy can easily be exposed to sesquiterpene lactones, and they can develop contact dermatitis.

Gardenia is a popular ornamental plant around the world. The fruits of *Gardenia jasminoides* (Rubiaceae) have been used as a traditional medicine for treating liver and bladder disease. The gardenia fruit contains some effective constituents including flavonoids, carotenoids, iridoids and glycosides. These ingredients have shown anti-tumor effects, antioxidant activity, antithrombotic effects and anti-angiogenic activity [18-20]. Genipin, an aglycone derived from geniposide found in *Gardenia jasminoides*, is known to be an excellent natural cross-linker, a strong apoptosis inducer and an effective antiviral agent [21].

The medical costs related to occupational hazards are huge [22-25], and occupational dermatoses affect society and the economy. The economic effects of occupational dermatoses include the costs of re-education, in-service training, the loss of production, and treatment. Our patient's employer and the economy were affected by her absence from the work and salaries or her medical costs. In developing countries, the number of reported cases of occupational dermatoses might be small, as workers may fear losing their jobs and livelihoods.

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