

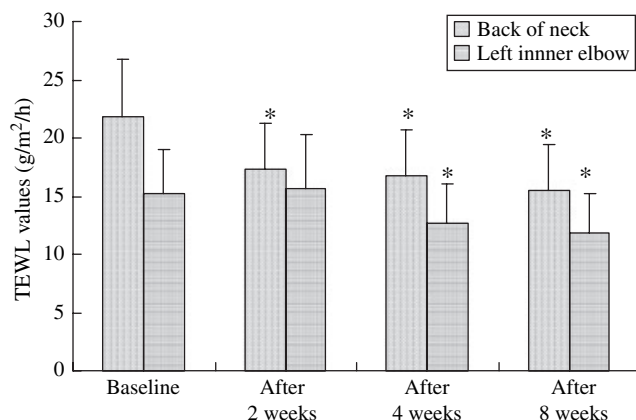


Figure 1. Effect of oral intake of glucosylceramides on transepidermal water loss (TEWL) on the back of neck and left inner elbow. TEWL (g/m²/h) values were significantly (* $P < 0.05$) decreased after intake of glucosylceramides derived from *Amorphophallus konjac* in comparison to baseline. The data are expressed as means + SEM.

Amorphophallus konjac on atopic dry skin in patients with atopic eczema. Konjac from *A. konjac* is very popular in Japan as a cooking supplement. Recently, glucosylceramides from *A. konjac* were purified, and it is now available as nourishment from Unitika Ltd. (Kyoto, Japan).

Fourteen patients with mild to moderate atopic eczema (mean SCORAD index + SEM : 15.8 + 1.4) (nine female and five male, mean age 32 years, range 20–54 years) were studied after obtaining informed consent (4). Glucosylceramides from *A. konjac* were obtained from Unitika Ltd. and quantified using the modified method of HPLC with evaporative light scattering detection (5). Glucosylceramides 0.6 mg/capsule were incorporated into soft capsules. Patients with atopic eczema took three soft capsules orally, i.e. 1.8 mg/day for 8 weeks. Our preliminary study revealed that oral intake of 1.2 mg of glucosylceramides from *A. konjac* per day significantly improved transepidermal water loss (TEWL) in healthy subjects (data not shown). Since TEWL of the patients with atopic eczema was greater than that of healthy subjects, 1.8 mg glucosylceramides per day was administered to patients with atopic eczema.

Transepidermal water loss values on back of neck and left inner elbow were measured by Tewameter (C + K Co. Ltd., Koeln, Germany) at baseline, and after 2, 4, and 8 weeks. These measurements were performed in a room controlled to

the specified conditions (temperature: 21–23°C, humidity: 45–55%) after acclimation for 45 min. Statistical analysis was performed with Student's *t*-test.

As shown in Fig. 1, TEWL values on the back of neck were significantly ($P < 0.05$) decreased after 2, 4, and 8 weeks of intake of glucosylceramides in comparison to baseline (Fig. 1). Moreover, TEWL values on left inner elbow were also significantly ($P < 0.05$) decreased after 4 and 8 weeks of the intake of glucosylceramides. After 8 weeks, SCORAD index was significantly ($P < 0.01$) decreased (mean + SEM : 13.2 + 1.2). There were no side effects in any of the subjects.

The decrease in TEWL values seems to be due to the fact that the order of the packing of stratum corneum becomes tighter during intake period. It is reported that stratum corneum's packing is disordered even in nonlesional site in patients with atopic eczema with respect to stratum corneum in healthy subjects (2). Collectively, oral intake of glucosylceramide may be effective as a complementary and alternative treatment for improvement of barrier function in atopic eczema.

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Occupational IgE-mediated allergy to a common house spider (*Tegenaria domestica*)

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Key words: IgE-mediated allergy; house spider; protein contact dermatitis.

Occupational allergy to insects such as beetles, cockroaches, locusts, moths and flies can occur in laboratory and agricultural workers (1). Farmers and greenhouse workers may suffer from respiratory allergy to storage and spider mites (2).

Airborne allergy to house spider.

Table 1. Skin prick test and IgE antibody assay results to a common house spider, various mites and insects in an allergic pig farmer

	Skin prick test wheal diameter in mm	IgE immunospot	Cap FEIA kU/l
House spider			
Whole-body extract	8–11*	3 +	<0.4**
Spider net	5	nd	nd
Mites			
House-dust mites	0	–	<0.4
Storage mites	0	–	<0.4
Insects			
House fly	0	–	nd
Mosquito	nd	–	<0.4
Cockroach	0	–	<0.4
Silkworm	nd	–	<0.4

*Histamine (10 mg/ml) 6 mm; **in-house RAST.
nd, not done.

Spiders belong to the same phylum as mites and several species live within human contact. Reports on allergic reactions from spiders are, however, rare (3, 4).

A 45-year-old pig farmer was admitted due to a 7 month history of eczema on his face, neck and hands. At examination, red scaly eczema, confirmed by a biopsy, was seen on his forehead, cheeks, neck, back of the hands, wrists and lower arms. The areas were the same that were not covered by any clothing when the patient worked in the pigsty. Eczema was more active during the days he worked in the pigsty and disappeared within 1–2 weeks when he stayed away from his work. A controlled exposure caused on the third day a flare-up of eczema on his face, neck and hands but no respiratory symptoms.

The number of flies and spiders had suddenly increased in the pigsty 2 years earlier and, at present, thick mattresses of spider nets covered some roof corners. The prevalent fly was a common house fly (*Musca domestica*) and the spider a 6–10 mm long brownish house spider (*Tegenaria domestica*, Agelenidae, Araneae). Skin prick tests performed with house spider and its net moistened in physiological saline were clearly positive in the patient but negative in two control farmers and three healthy subjects (Table 1). Open application test with house spider caused wealing. Skin prick and patch tests to pig hair, dander, food

and cereals were negative, as were house-dust mite (*Dermatophagoides pteronyssinus*, *D. farinae*; ALK a/s), storage mite (*Acarus siro*, *Lepidoglyphus destructor*, *Tyrophagus putrescentiae*), cockroach (*Blattella germanica*) and silkworm (*Bombyx mori*) allergens (Table 1).

Immunospot performed with house spider (1:10 wt/vol) extract showed distinct IgE binding from the patient serum (Fig. 1) but was negative with various mites and insects (Table 1). In-house

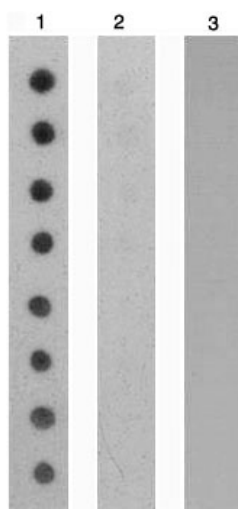


Figure 1. IgE immunospot to house spider with the patient (lane 1), control (lane 2) and normal serum (lane 3). The patient serum (diluted 1/16) shows positive immunospots to spider extract (1:10 wt/vol) and its twofold dilutions performed in duplicate.

spider RAST showed similar IgE level in the patient (438 cpm) and control farmer (326 cpm). IgE immunoblotting with spider extract, performed in reduced and nonreduced conditions, was also negative.

To our knowledge the present patient is the first reported case of IgE-mediated occupational allergy to a common house spider (*T. domestica*) which is widespread in Europe. SPT and immunospot assay confirmed that the patient had IgE antibodies to this spider species but not to any insect or mite species tested. This shows that sensitization to the house spider was specific and not due to any cross-reactivity from tropomyosin or other insect or mite panallergens (1). The reason why we could demonstrate IgE antibodies to house spider only with SPT and immunospot but not with RAST or immunoblotting could be that the allergen is spider silk. This consists of two proteins assembling rapidly to non-soluble fibrillar structures due to which epitopes could easily be masked (5).

The clinical outcome of the present patient was different from the few previously reported cases of spider allergy. These patients have exhibited eye symptoms from the contact with spider material or whealing from spider hair contact (3, 4). The present patient had no direct contact with house spiders when working in the pigsty and reacted with flare ups of eczema. This kind of reactivity fits well with airborne spread of house spider allergens causing protein contact dermatitis in uncovered skin areas. Previously, farmers sensitized to spider or storage mites are known to suffer from similar recurrent contact dermatitis (6).

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