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<http://dx.doi.org/10.1016/j.aller.2012.11.001>

Occupational airborne contact dermatitis caused by usnic acid in a domestic worker

To the Editor,

Lichens are composite organisms consisting of the permanent association between a fungus and an alga. The fungus component is called mycobiont and the algal component is called phycobiont; both grow in a symbiotic relationship¹, usnic acid is one of their main components and it is found in different types of lichens.² In Portugal, there are four predominant species of lichens: *Parmelia reticulata*, *P. caperata*, *Ramalina lusitana*, and *R. usnea*, which grow mainly on olive trees.^{3,4} Airborne allergic contact dermatitis (AACD) caused by lichens^{4,5} may simulate photodermatitis due to its preferential location in exposed areas of the skin. In rural workers, AACD may appear in the context of an occupational dermatitis, which is sometimes disabling, or it may affect those involved in outdoor leisure activities.⁵

Herein, we described the case of a 46-year-old Caucasian woman, rural domestic worker, who carried oak and olive wood for fireplaces, mainly between the months of October and March.

The patient was referred to the dermatology department because of an intensely pruritic erythematous scaling dermatitis, involving the face, neckline, and extensor surface of the hands, forearms and lower limbs. On the face, the eyelids, earlobes, and retroauricular fold were affected. The extensor surface of the forearms and hands showed extensive lichenification (Fig. 1). The dermatitis had started in the autumn, and persisted throughout the winter, with worsening on the uncovered areas in the beginning of the spring.

The patient had a history of asthmatic bronchitis and allergic rhinitis in childhood and had been followed for her respiratory allergies since 1993. Her most recent laboratory investigations showed: D2-*Dermatophagoides farinae* specific IgE 90.10 kU/L (class 5); D1 *D. pteronyssinus* specific IgE > 100 kU/L (class 6), and total Ig E 1977 U/mL (ref < 87).

The patient underwent patch testing with the Basic Series adopted by the GPEDC (Grupo Português das Dermite de Contacto), and the Gloves and Clothing Series, all of which were negative.

Faced with the possibility of photodermatitis, the patient performed tests with the Photo Allergen Series, which showed the following positivities: lichen acid mix and usnic acid, after UVA irradiation with 5 J/cm² (Table 1 and Fig. 2).



Figure 1 Erythematous-squamous dermatitis, involving the face, eyelids, earlobes, retroauricular fold, neckline, extensor surface of the hands and forearms.

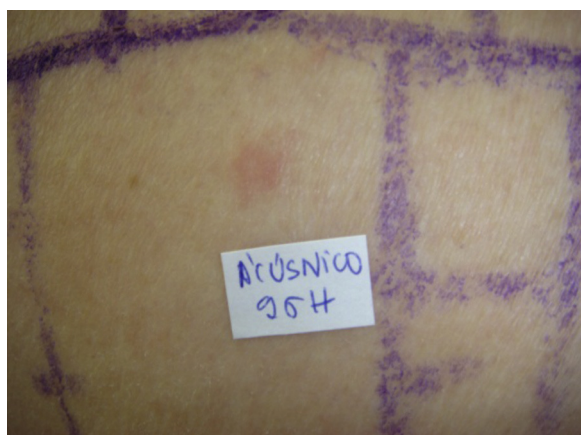


Figure 2 Positivity to usnic acid, after UVA irradiation with 5 J/cm².

Patients with lichen allergies may be photosensitive and score positively on photoepicutaneous tests. The clinical relevance of this phenomenon is yet to be established.⁴ Our patient was a rural worker who carried oak and olive wood during the cold months, and who developed dermatitis of sun-exposed areas, with accentuated lichenification of the dorsal hands and forearms, which worsened with exposure to sunlight. When faced with a rash on photo-exposed areas, and outdoor activity, one should always think of photosensitivity or AACD. In this case, the study with the Photo Allergen Series revealed positivity to lichen acid mix and usnic acid, which increased after UVA irradiation, thus confirming the diagnostic hypothesis of AACD.

Immediate hypersensitivity after exposure to lichens has also been described, which is usually manifested through respiratory symptomatology.¹ However, even though our patient had a history of respiratory allergies, there is no evidence to support that they occurred in this setting.

Usnic acid is a lichen component which is found in species such as: *Parmelias*, *Evernia*, *Usnea*, *Lecanora*, *Cladonia* or *Ramalina*, and which may be photosensitising (Fig. 3). These types of lichens are epiphytic, i.e. grow on tree trunks, and only a few survive in the polluted air of the cities, contaminated with sulphur dioxide. When lichens are fragmented by handling, they release particles that can settle on the exposed skin and may cause AACD,¹ an occupational dermatitis that affects rural workers who cut tree trunks, or individuals with sporadic exposure during outdoor leisure activities.⁵⁻⁷ There may be concomitant reactions with the *Frullania* family due to cohabitation of both species. The existence of contact dermatitis caused by allergy to the



Figure 3 *Parmelia* species. This genus of lichens is common in olive and cork trees.

Frullania's sesquiterpene lactones may predispose subjects to being sensitive to lichen chemical compounds.⁸

Lichen contact allergy is an old and often overlooked dermatitis that should be considered for subjects in contact with barked wood or wood dust. It is important to know the native species from each country to have a certain aetiological factor. In Portugal, several studies have been published in which the main aetiological sources of this type of dermatitis, both occupational and leisure-related, are described.⁹

Moreover, numerous lichen components, such as usnic acid and atranorin ('oak moss'), are used in perfumery. Nowadays, this is the main cause of sensitisation to this type of substances.

Ethical disclosures

Protection of human subjects and animals in research. The authors declare that no experiments were performed on humans or animals for this investigation.

Patients' data protection. The authors declare that no patient data appears in this article.

Right to privacy and informed consent. The authors declare that no patient data appears in this article.

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Table 1 Series of photo allergens after UVA irradiation of 5 J/cm².

	48 h	96 h	Irrad UVA 5 J/cm ² 48 h
Lichen acid mix	+	+	++
Usnic acid	+	+	++

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<http://dx.doi.org/10.1016/j.aller.2012.07.017>

VI nerve palsy after intravenous immunoglobulin in Kawasaki disease

To the Editor,

Kawasaki disease (KD) is an acute panvasculitis with special affinity for the coronary arteries. Diagnosis requires unexplained fever and at least four of five additional features.¹ These features include: bilateral conjunctival injection; red, dry, fissured lips, injected oropharynx or cervical lymphadenopathy; and oedema, erythema and desquamation of the digits and of palmar and plantar surfaces of hands and feet.¹ The most common ophthalmologic manifestations of KD are bilateral conjunctival injection and non-granulomatous iridocyclitis.^{2,3} Sixth nerve palsy is a recognized yet uncommon manifestation reported in KD. Interestingly, all the cases to date have been associated after IVIG infusion. We report a case of a patient with KD who presented VI nerve palsy after IVIG infusion and review the literature.

Case report

A six-year-old Mexican boy was admitted to the emergency department with a five-day history of fever and a maculopapular rash. The rash began on his back and thighs and later spread to cover the entire body. He also presented abdominal pain, vomiting and diarrhoea. On physical examination the patient presented bilateral non-exudative conjunctivitis, dry red lips, injected pharynx, and confluent, erythematous, papular rashes over the face, trunk, and limbs. There were no hepatosplenomegaly, lymphadenopathy or extremity changes. Neurologic examination was unremarkable.

Laboratory tests showed Hb 11 g/dl, white blood cell count was 3700 mm^{-3} , 90% segmented neutrophils, 6% lymphocytes, and $148,000\text{ mm}^{-3}$ platelets. Erythrocyte sedimentation rate was 18 mm/h with a normal urinalysis.

He was hospitalized with a diagnosis of incomplete Kawasaki disease (fever and three of the five criteria: conjunctivitis, change in mucous membranes and rash) and an echocardiography was performed, which was reported normal. The patient was treated with intravenous immunoglobulin (2 g/kg) and aspirin. Fever subsided one day after the initiation of immunoglobulin. On day 6 the patient started with bilateral skin peeling of his hands and

feet. At this point, the patient fulfilled the AHA 2004 classic clinical criteria. The ophthalmologic evaluation showed normal pupillary light reactions, with visual acuities in the right eye 20/50 and in the left eye 20/50, with tortuosity of the retinal vessels consistent with bilateral ocular vasculitis.

On day 5 the patient complained of double vision. Neurological examination revealed a right sixth cranial nerve palsy. Cerebral magnetic resonance was performed which did not show abnormal findings. A fluorescein angiography was performed which showed mild leakage suggestive of vasculitis. The patient's condition improved but cranial nerve palsy persisted. Oral corticosteroids were added (oral prednisone 0.5 mg/kg/day) with improvement of the ocular symptomatology and the patient was discharged on the 18th day.

Discussion

Kawasaki disease is one of the most common types of pediatric vasculitis. Neurological manifestations of KD are common and diverse with irritability, lethargy, and aseptic meningitis being the most frequent.¹ Acute and subacute encephalopathy, seizures, cerebral infarction, ataxia, myositis, and lower motor neuron facial nerve palsy have also been described.¹ Facial nerve palsy has been associated with increased mortality.⁴ The most common ophthalmologic manifestations of KD are bilateral conjunctival injection and non-granulomatous iridocyclitis. Ocular evaluation with slit-lamp examination has been suggested as a part of the work-up in doubtful cases. Other ocular manifestations that have been described include punctate keratitis, vitreous opacities, optic disc swelling, retinal ischemia, vascular occlusion, orbital myositis, and periorbital vasculitis.^{5–9}

Two previous cases of KD and VI nerve palsy have been described.^{10,11} Guven et al. report a 12-year-old female with KD and sixth-nerve palsy who was treated with steroids and aspirin.¹⁰ Wurzbürger et al. reported a seven-year-old female who presented with fever, rash, neck pain, conjunctival injection and dry red lips.¹¹ She presented with vomiting, headache and Brudzinski's sign suggestive of aseptic meningitis. Slit examination was normal. Wurzbürger hypothesized that the findings of the sixth cranial nerve palsy could be secondary to a vasculopathic phenomenon.¹¹ Although in our case ocular vasculitis was documented, the development of