

## Short Communication

### Contact dermatitis and prolonged photosensitivity induced by ketoprofen and associated with sensitivity to benzophenone-3

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The increasing topical use of NSAIDs has resulted in a number of case reports, mainly of photocontact dermatitis, since 1983 (1).

#### Case Report

Following a sports injury, a 34-year-old woman applied ibuprofen (Ibuleve<sup>®</sup> gel) topically to the right popliteal fossa and right shoulder. On 1 occasion, she used instead a ketoprofen gel (Oruvail). 4 days after this, erythema and blistering developed at the sites of application, which had both been intermittently exposed to Scottish spring sunlight. Over 24 h, the eruption extended to involve, the legs, thighs, neck, chest and hands, including the palms. There was accompanying generalized pruritus, nausea and diarrhoea. Some years previously, a mildly itchy rash had occurred at the site of application of an unknown substance, but there was no other history of eczema, photosensitivity or drug sensitivity. The eruption rapidly resolved on inpatient treatment with potent topical corticosteroids, eosin, ichthammol and occlusive dressings.

1 month later, on a sunny holiday and after taking oral mefenamic acid, acute severe eczema recurred in the right popliteal fossa, followed by ulceration. Topical corticosteroids were ineffective until used under occlusion. When dressings were removed, acute eczema recurred. Healing was complicated by hypertrophic scarring.

6 months after the initial eruption, and on another sunny holiday, there was a further recurrence of eczema of the right popliteal fossa. NSAIDs had not been used topically since the initial presentation and no further NSAIDs had been taken orally.

She was patch tested with the European standard series, individual ingredients of Ibuleve<sup>®</sup> gel, and ibuprofen, ketoprofen, mefenamic acid, naproxen, diclofenac, flurbiprofen, and piroxicam, each 5% pet., using Finn Chambers on Scanpor tape and standard application and reading times. Photopatch testing was subsequently carried out to a series of photosensitizers and a dilution series of ketoprofen, irradiating at D2 with 6 J/cm<sup>2</sup> UVA from a TL09 light source. The only positive patch test was to ketoprofen, at 5% pet. and on dilution, at D4 (Table 1). Photopatch testing gave stronger and earlier reactions to ketoprofen, plus a strong reaction to benzophenone-3 by D4 (Table 1).

#### Discussion

Both topical and oral NSAIDs cause photosensitivity reactions (1, 2), but persistent light reactions or recurrent photosensitivity following exposure have not been reported. Each localized recurrence in this patient was provoked, in the absence of reexposure to the precipitating allergen, by exposure of the skin to strong sunlight at latitudes far south of Scotland. To date, there have been no reports of ketoprofen-induced photosensitivity from the more northerly latitudes of the UK, where sunlight is less intense, most having been reported from Mediterranean countries. Cross-reaction with ketoprofen is uncommon, only flurbiprofen, tiaprofenic acid, ibuprofen and fenofibrate having previously been reported (1, 3–5).

Photopatch test results showed both photocontact allergy to benzophenone-3 (a known photosensitizer) (6) and photo-enhancement of contact allergy to ketoprofen. Such an association has been reported only 1× previously (1), despite the chemical similarity between the 2 molecules. When irradiated with sunlight, keto-

Table 1. Positive results of patch and photopatch tests

|                           | Patch tests |    |     | Photopatch tests |     |
|---------------------------|-------------|----|-----|------------------|-----|
|                           | D2          | D3 | D4  | D3               | D4  |
| benzophenone 3 10.0% pet. | –           | –  | –   | –                | +++ |
| ketoprofen 0.1% pet.      | –           | –  | +   | +++              | +++ |
| ketoprofen 0.25% pet.     | –           | –  | ++  | +++              | +++ |
| ketoprofen 0.5% pet.      | –           | –  | ++  | +++              | +++ |
| ketoprofen 1.0% pet.      | –           | –  | +++ | +++              | +++ |
| ketoprofen 2.0% pet.      | –           | –  | +++ | +++              | +++ |

profen is broken down into various benzophenones structurally related to benzophenone-3 (7). With the increasingly widespread use of benzophenone-3 in cosmetics, it is likely that contact and photocontact sensitivity to it will become more common. Patients with these sensitivities should perhaps also be warned about potential sensitivity to ketoprofen.

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