

Why is occupational photocontact allergic dermatitis caused by ketoprofen rarely reported in the literature?

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Photocontact allergy is a well-known side-effect of topical preparations of the non-steroidal anti-inflammatory drug (NSAID) ketoprofen (1, 2). Cross-reactions are also typically described with this substance (3). Mainly reported as a side-effect of topical treatment, it seems that this allergy affects more patients (who apply the treatment) than healthcare workers (who prepare and dispense ketoprofen) (4). Using the case of a nurse, we discuss why occupational allergic contact dermatitis is so rare.

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Case Report

A 43-year-old nurse working in an internal medicine department of a French hospital presented with an itchy vesicular rash on the hands (Fig. 1) that appeared 48 h after she had handled ketoprofen in the workplace in August 2016. When preparing an injection, she broke the ampoule (Figure S1), and the solution spread onto her hands. Although she immediately rinsed her hands for 5 min under running water, dermatitis appeared 48 h later, following sun exposure during a day off work. For the dermatitis to resolve, 4 weeks of sick leave and topical application of corticosteroids were necessary. The patient had no history of personal atopy, but, 7 years previously, had experienced allergic contact dermatitis after using KETUM[®] containing 2.5% ketoprofen, deionized water, carbomer, diethanolamine and oil for the topical



Fig. 1. Hand lesions of a nurse 48h after using ketoprofen.

treatment of a tendinopathy. She had also experienced a previous skin reaction to a sunscreen.

Patch testing with the European baseline series, with 48 h of exposure and readings on day (D) 2 and D4 according to ICDRG/ESCD guidelines, showed sensitization to nickel sulfate (+), *Myroxylon pereirae* (balsam of Peru), (+) and fragrance mix I (++). Patch testing with ketoprofen showed a positive reaction (+) on D4. Photo-patch testing with ketoprofen showed sensitization (++) after 10 J/cm² ultraviolet (UV) A irradiation (at the reading after 48 h). There was no sensitization to diethanolamine.

In conclusion, the patient's photoaggravated eczema on the hands was diagnosed as occupational allergic contact dermatitis caused by ketoprofen.

Discussion

In the literature, occupation-related allergic contact dermatitis caused by ketoprofen is rarely reported, possibly for the following reasons:

- Ketoprofen is commonly prescribed in some countries, including France, and mostly for musculoskeletal complaints (4), and the healthcare worker presented here was initially affected outside the workplace. Occupational disease occurred at a later date during contact with the same substance.
- Occupational exposure concerns a small population, mainly nurses and doctors.
- Among this population, few people prepare ketoprofen injections, as there are many other NSAIDs available in hospitals.

- Prior sensitization requires contact with ketoprofen or contact with substances that induce cross-reactions.
- The nurse in this case was sensitized to both fragrance mix I and ketoprofen, an association that is frequent but still not clearly understood (5, 6). Moreover, the skin reaction to the above-mentioned sunscreen could have been allergic contact dermatitis caused by octocrylene or benzophenone [which cross-reacts with ketoprofen (3)] or by another substance, such as cinnamyl alcohol. Unfortunately, the nurse could not recall the brand of sunscreen, making it impossible to test its components.
- Photoallergic or photoaggravated contact dermatitis requires UV exposure, and the accidental contact with ketoprofen in our case occurred in August, that is, a summer month.
- Many people are unaware of this side-effect of ketoprofen. For example, the nurse in our study continued to expose herself to the sun even after the appearance of lesions on her skin. As a result, the dermatitis worsened.
- Patch testing showed both sensitization and photosensitization in our study, so photoaggravated allergic contact dermatitis, and not strictly a photoallergic reaction, was diagnosed.
- As this particular occupational dermatitis is not well known to general practitioners or emergency doctors, ketoprofen-induced skin disease may be underdiagnosed in France.
- Many will be unaware of the fact that the present case would qualify as an occupational disease, meaning eligibility for social security benefits.

To conclude, occupational contact dermatitis caused by ketoprofen in healthcare workers is rarely reported in the scientific literature, because it seems to occur exceptionally. It would appear that this dermatitis is only triggered through a combination of factors.

Supporting Information

Additional Supporting Information may be found in the online version of this article:

Figure S1. Ketoprofen ampoule type used by the nurse at the time of the accident.

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