

Contact allergy to corticosteroids in asthma/rhinitis patients

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Key words: contact allergy; asthma; rhinitis; corticosteroids; adverse reactions; medicaments; treatment failures. © Munksgaard, 1999.

Patients with asthma and/or rhinitis, when using inhalers or nasal sprays containing corticosteroids, may experience mucosal symptoms, such as congestion of the nose, itching, nose bleeding and worsening of rhinitis, but also eczema of the face sometimes spreading to flexures, and sometimes the corticosteroid simply does not help. Few patients with such symptoms have been found to be allergic to their inhaled corticosteroids (1), and no report on whether contact allergy to corticosteroids could explain treatment failures is available. This issue was investigated in 2 ways: (i) by testing asthma/rhinitis patients for corticosteroid allergy, (ii) by looking at the prevalence of tixocortol pivalate allergy among dermatitis patients with and without asthma/rhinitis, respectively.

Patients and Methods

(i) 34 patients (10 with asthma, 13 with rhinitis, 11 with both), treated with corticosteroid inhalers and/or nasal sprays, and with symptoms such as lack of therapeutic effect, facial rashes, nose bleeding, burning sensations on the neck and arms, urticaria, general pruritus, and nasal septum ulceration and perforation, were patch tested with our standard series, including tixocortol pivalate (1.0% pet.) and budesonide (0.1% pet.), and an additional asthma/rhinitis series comprising 17 substances (Table 1). The tests were read after 3 and 7 days.

(ii) Since tixocortol pivalate was inserted in our standard series, 3951 consecutive dermatitis patients have been patch tested. For comparison, the contact allergy rates for tixocortol pivalate in these patients with and

without asthma/rhinitis (using the DALUK system information (2)) were looked at.

Results

(i) 1 case of tixocortol pivalate contact allergy was detected and 1 patient was found to be allergic to Tween 80. Other substances in the additional asthma/rhinitis series were negative. In 18 patients, 52 positive reactions to 21 sensitizers in our standard series were recorded (nickel 7, gold sodium thiosulfate 6, balsam of Peru 5, perfume mix 4, Kathon CG 3, palladium chloride 3, colophony 3, thimerosal 3, PPD 2, neomycin 2, Amerchol L-101 2, cobalt 2, formaldehyde 2, and tixocortol pivalate, quinoline mix, ethylenediamine, Germal II, Germal 115, benzocaine, chromium and black rubber mix, 1 each).

(ii) 40 out of 3951 (1.0%) dermatitis patients were hypersensitive to tixocortol pivalate. The tixocortol pivalate contact allergy rate for patients, with and without asthma/rhinitis, was 1.4% (1018 patients) and 0.9% (2933 patients), respectively.

Discussion

The patient allergic to tixocortol pivalate was tested with a dilution series of budesonide and also found to be allergic to this corticosteroid, present in both nasal and pulmonary preparations (3). From this pilot study, it appears that corticosteroid contact allergy does not seem to explain a significant number of adverse skin and/or mucosal symptoms or treatment failures in asthma/rhinitis patients. The fact that consecutive dermatitis patients with asthma/rhinitis had a higher, although not statistically significant ($p < 0.2$, χ^2 test), contact allergy rate to tixocortol pivalate, would be expected, since the asthma/rhinitis patients have 2 possible routes of corticosteroid exposure (skin and mucosa), as well as a higher frequency of atopic dermatitis with chronic eczema, a known risk factor for corticosteroid allergy (4).

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Table 1. Asthma/rhinitis patch test series

alclometasone dipropionate	1%	pet.
beclomethasone dipropionate	1%	eth.
betamethasone dipropionate	1%	eth.
betamethasone valerate	1%	eth.
clobetasol propionate	1%	eth.
flunisolide	2%	eth.
fluticasone propionate	1%	eth.
hydrocortisone alcohol	0.5%	DMSO/eth.
mometasone furoate	1%	eth./acet.
triamcinolone acetonide	1%	pet.
benzalkonium chloride	0.1%	aq.
butylated hydroxytoluene (BHT)	2%	pet.
DMSO/ethanol	50/50	
phenoxyethanol	1%	pet.
polysorbate 80 (tween 80)	5%	pet.
propylene glycol	5%	pet.
sodium metabisulfite	2%	pet.

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Acute irritant contact dermatitis from propionic acid used in animal feed preservation

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Case Report

A 29-year-old farmer came with a painful, sharply demarcated erythema on the left calf, measuring 11×7 cm, with widespread blistering. 4 days previously, he had been in contact with Luprosil® (99.5% propionic acid) on setting up pre-wilted silage. The undiluted acid had penetrated his clothing onto this calf. Topical corticosteroids cleared the erythema and relieved the pain.

Discussion

Propionic acid ($\text{CH}_3\text{-CH}_2\text{-COOH}$) is a short-chain carboxylic acid. Some of its derivatives are active components of NSAIDs (e.g., ibuprofen and ketoprofen), occasional causes of (photo)allergic or phototoxic contact dermatitis (1). There have been no previous case reports of dermatitis after contact with unsubstituted propionic acid.

Its bacteriological and fungistatic effects have for a long time made propionic acid a successful preservative for baking products, cereals and other agricultural products, including animal feed. The climate of Southern Germany and neighbouring alpine countries means that, for 6 months of the year, preserved feed has to be provided for dairy cattle. Increasingly, silage is used (e.g., maize and grass silage) as a relatively low-loss preservation method (2). Here, following the creation of aerobic conditions and reduction of the pH value, the growth of lactic acid bacteria is promoted and unwanted micro organisms suppressed.

The use of unsubstituted propionic acid as silage agent is permitted in Germany (3), and it is also success-

fully used in other countries, as it improves the preconditions for good fermentation and generally stabilizes the silage. It is used at concentrations between 0.4% and 0.7%, for cut surfaces at 25% concentration (4). The biostatic effect prevents faulty fermentation with bacteria such as clostridia, or any growth of mould (5) that produces toxins.

Propionic acid, a strong chemical irritant, is widely used as an agricultural preservative. Particular care and attention is vital, especially when used at higher concentrations. The use of adequate protective clothing is recommended to avoid any skin contact with the risk of possible caustic burns.

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