



Letters

Recurrent otitis externa owing to allergic contact dermatitis to topical medications

Otitis externa is an inflammatory condition of the external ear canal because of bacterial, fungal, or noninfectious causes. Noninfectious otitis is caused by dermatologic diseases such as psoriasis, atopic, seborrheic, and contact dermatitis. Here, we discuss the case of a woman presenting with recurrent otitis externa owing to contact dermatitis to topical medications prescribed to treat her otitis.

A 45-year-old Hispanic woman with poorly controlled asthma presented to an ear, nose, and throat specialist after 2 weeks of bilateral ear pain despite using hydrocortisone-acetic acid solution 4 times per day. Symptoms progressed to severe bilateral external ear swelling, erythema, crusting and ear canal secretions, pruritus, and pain over the next 3 weeks. She did not present any other signs of inflammatory dermatitis nor suffered from diabetes. She was started on neomycin-polymyxin B-hydrocortisone solution 4 times per day for 2 weeks without improvement. The ear, nose, and throat physician discontinued topical treatments, and the patient was admitted to the hospital to receive intravenous antibiotics for malignant otitis externa. The allergy-immunology service was consulted to exclude immune deficiency. She denied any history of recurrent respiratory infections, sinusitis, or skin infections. Tests for immunoglobulins and T cell functions were normal. She slowly improved after 2 weeks of intravenous antibiotics and was discharged on oral antibiotics and acetic acid-hydrocortisone otic solution. However, 1 week later, bilateral ear swelling, erythema, itching, and crusting recurred.

Noninfectious otitis externa causes ear pain, pruritus, discharge, erythema, and edema, frequently leading to a secondary infection. Pruritus is more prominent than pain, and discharge is usually scaly and flaky, not purulent as in infectious causes. Patients with atopic or seborrheic dermatitis usually have other body lesions suggesting the diagnosis. Because of her recurrent clinical course, contact dermatitis was suspected. We conducted patch testing to a dilute acetic acid 2% solution, hydrocortisone/acetic acid 1%/2% solution, neomycin, and bacitracin in addition to a series of topical steroid classes including tixocortol-21-pivalate (class A), budesonide (class B), and hydrocortisone-17-butyrate (class D2) (Dormer). Patch test reading at 3 days was positive to acetic acid (+3), acetic acid/hydrocortisone (+3), neomycin (+2), and tixocortol-21-pivalate (+3). Our patient had negative patch reactions to bacitracin, budesonide, and hydrocortisone-17-butyrate. The 5-day reading indicated increased erythema and vesicles on the tixocortol and acetic acid-containing chambers (Fig 1). By the seventh day, the vesicles decreased, and the skin turned scaly with erythema, most remarkable on neomycin and tixocortol.

Allergic contact dermatitis in the ear canal can be caused by topical antibiotics, anesthetics, preservatives, shampoos, detergents, soaps, hair sprays, and dyes. Yarikas et al¹ conducted a case-control study to evaluate the association of allergic contact dermatitis and otitis externa. Among 66 subjects with otitis, 28.8% had a positive patch test result compared with 3% of the 48 control subjects. The most common causes were neomycin in 35.5%, potassium dichromate in 19%, and formaldehyde in 12%.¹

Neomycin is the second most common positive allergen overall from the North American Contact Dermatitis panel, detected in 8.7% of cases. It is associated with scalp, lip, periorbital, hand, and anogenital dermatitis. As in the case of our patient, neomycin produces its maximal patch test reaction on late readings on day 7. It is a common ingredient in topical medications.²

Topical corticosteroid allergy occurs in 0.5% to 5.8% of patients. It also produces late peak reactions, and thus, should be read 7 days after patch placement.² Steroid allergy should be suspected in patients with skin barrier dysfunction or inflammation that does not respond or worsens despite the long-term application of topical



Figure 1. Patch test results on day 5 indicating “+3” reaction to acetic acid, acetic acid with hydrocortisone, and tixocortol, and “+2” reaction to neomycin. Test results are negative for budesonide and hydrocortisone-17-butyrate.

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steroids.³ Tixocortol represents class A corticosteroids, which also includes hydrocortisone acetate, methylprednisolone, and prednisone. Class B steroids include budesonide and triamcinolone, and class D1 includes clobetasol-17-propionate, mometasone, and fluticasone. Class D2, represented by hydrocortisone-17-butyrate, also includes hydrocortisone valerate. Occasionally, class A allergens cross-react with class D2, but that was not the case in our patient who had a negative patch reaction to hydrocortisone-17-butyrate. Given that a steroid allergy could also influence her asthma treatment,³ she was advised to use class B (budesonide) or D1 corticosteroids (clobetasol-17-propionate) as maintenance therapy for her asthma and class D2 (hydrocortisone 17-butyrate) topically, if required.

Acetic acid is a topical agent used for external otitis treatment. Byun et al⁴ reported a case of occupational allergic contact dermatitis in a laboratory worker exposed to trifluoroacetic acid. He found that control subjects did not react to trifluoroacetic acid, consistent with allergic rather than irritant reactions.⁴ In our patient, the acetic acid-containing chambers had a maximal reaction on the fifth day, also supporting the diagnosis of allergic contact dermatitis. We postulate that the recurrent use of acetic acid may have damaged the epithelia and lead to sensitization to other topical medications. Unfortunately, patch testing to benzethonium chloride and propylene glycol was not conducted to exclude allergic contact dermatitis to the preservative in the medication.

The patient was instructed to avoid solutions with acetic acid, neomycin, and group A corticosteroids. She recovered completely, and her asthma also became controlled. This case adds to the evidence that topical medications, including anti-infective and anti-inflammatory medications, can induce allergic contact dermatitis, which can lead to noninfectious otitis externa.

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