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Hypersensitivity to topical corticosteroids in otitis externa

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Abstract

Over a 12-month period, nine patients were seen in a contact dermatitis clinic with an inflammatory dermatosis localized predominantly to the external auditory canal. Of these patients, four were found to have an allergic contact dermatitis which was exacerbating their dermatitis. All were allergic to one or more corticosteroids and topical antibiotics used in the treatment of their dermatitis. We would suggest that hypersensitivity to topical corticosteroids and other medicaments be considered in patients with otitis externa which fails to respond to treatment.

Key words: Otitis externa; Dermatitis, contact; Ointments; Hydrocortisone, topical

Introduction

Dermatitis of the external ear may be a primary manifestation of an allergic contact dermatitis. In particular the following patterns of dermatitis are recognized (Fisher, 1986; Lembo *et al.*, 1988):

- Earlobe dermatitis predominantly caused by nickel containing jewellery.
- Postauricular dermatitis from nickel, plastics, glues and acrylates in spectacle frames and hearing aids. Individuals sensitive to fragrance may also develop a dermatitis from the application of perfume to this area.
- Dermatitis of the helix from the application of allergenic preparations to the scalp hair, notably the black hair dye paraphenylenediamine.
- Dermatitis of the external ear canal may be due to the insertion of nickel containing implements or match heads containing phosphorus sesquisulphide and/or potassium dichromate into the canal. Hearing aid inserts may also produce this pattern of dermatitis.

Other causes of dermatitis include rubber accelerators in individuals who wear rubber bathing caps and *p*-toluene sulphonamide formaldehyde resin in nail varnish of sensitized individuals who touch their ears.

Once an inflammatory dermatosis has developed it may be perpetuated or exacerbated by the development of sensitivity to a component of one of the medicaments used in the treatment. Neomycin and related antibiotics, topical anaesthetics, ethylene-diamine in Triadcorty® cream and preservatives are well known in this respect. Contact hypersensitivity from the corticosteroid within cortiscosteroid formulations is becoming increasingly recognized. In unselected patients attending contact dermatitis clinics, the prevalence of corticosteroid hypersensitivity has been found to vary between 4.8 per cent in Stoke-on-Trent, (Wilkinson *et al.*, 1991) and 4.9 per cent in Manchester (Burden and Beck, 1992) to 4.1 per cent in Finland (Lauerma, 1991) and 2.9 per cent in Belgium (Dooms-Goossens and Morren, 1992). Corticosteroid hypersensitivity is thought to occur more frequently in stasis dermatitis (Alani and Alani, 1972; Guin, 1984; Wilkinson *et al.*, 1990; Wilkinson and English, 1992) and perineal dermatitis (Wilkinson and English, 1992), in which allergies to other medicaments are common. As medicament sensitivity is also common in otitis externa we have looked at hypersensitivity to topical corticosteroids in this group of patients.

Patients and methods

All patients referred to our contact dermatitis clinic with persistent inflammation of the external auditory canal were patch tested to our standard ear batteries, which include a number of corticosteroids and other medicaments used in the topical treatment of otitis externa. Patch tests were performed using Finn chambers on Scanpor tape left *in situ* for 48 hours (Pirilä, 1975). The patch tests were read at two and four days. Reactions were scored as recommended by the International Contact Dermatitis Research Group (Wilkinson *et al.*, 1970) and were considered positive when an indurated erythematous (+) reaction or greater was present.

Results

Over a period of 12 months, nine patients with persistent or severe inflammation of the external auditory canal were patch tested. The clinical details are summarized in Table I. Five patients had negative patch tests (Nos. 1, 2, 3, 8 and 9) and the positive results in the remaining four patients (4–7) are summarized in Table II.

Discussion

The incidence of hypersensitivity to corticosteroids of

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TABLE I

CLINICAL FEATURES OF NINE CONSECUTIVE PATIENTS PATCH TESTED BECAUSE OF PERSISTENT OR SEVERE INFLAMMATION OF THE EXTERNAL EAR

Patient number	1	2	3	4	5	6	7	8	9
Age	49	49	42	70	58	31	37	62	54
Sex	M	M	M	M	F	F	M	M	F
Atopic	–	–	–	–	–	–	–	–	–
Duration of disease (years)	15	5	7	6	0.08	3	10	10	37
Psoriasis	+								
Seborrhoeic eczema		+	+	+					
Otitis externa					+	+	+	+	+

44 per cent in this small sample of patients with otitis externa is high. The incidence in other unselected patients with dermatitis attending our clinic is 4.9 per cent (Burden and Beck, 1992). This probably reflects the fact that only patients with severe or chronic otitis externa are referred to us. However, the prevalence of allergic reactions to corticosteroids was similar to that to neomycin emphasizing the importance of hypersensitivity to corticosteroids in this group of patients.

The steroid tixocortol pivalate, contained within the nasal preparation Pivalone®, has been shown to be a sensitive and specific patch test marker of hydrocortisone sensitivity (Wilkinson and English, 1991). In patients patch test positive to Pivalone® an intradermal injection of hydrocortisone sodium phosphate was positive at 24–48 hours. The commonest corticosteroid hypersensitivity was, therefore, to hydrocortisone occurring in three of the nine patients. Other corticosteroids producing positive patch test reactions in this group of patients were betamethasone valerate (2), hydrocortisone-17-butyrate (1) and clobetasone butyrate (1).

In the past, the significance of positive patch test reactions to topical corticosteroids has been uncertain. A use test in nine patients patch test positive to hydrocortisone-17-butyrate was positive in only 1 when performed on normal skin (Reitamo *et al.*, 1986). However when repeated on eczematous skin, the use of topical hydrocortisone resulted in an exacerbation of the dermatitis in 9 out of 11 of our patients patch test positive to Pivalone® (unpublished observations). Additionally, oral provocation with hydrocortisone and systemic ACTH have been shown to induce cutaneous reactions at the sites of allergic contact dermatitis caused by hydrocortisone and positive hydrocortisone patch tests (Sasaki, E., 1990; Lauerma *et al.*, 1991). Hydrocortisone and hydrocortisone-17-butyrate have also been shown to stimulate lymphocyte proliferation in an *in vitro* test (Lauerma *et al.*, 1990) in patients positive on patch testing to these steroids confirming that this is a manifestation of delayed-type hypersensitivity.

TABLE II

RESULTS OF PATCH TESTING IN FOUR PATIENTS WITH ALLERGIC CONTACT DERMATITIS

Patient number	4	5	6	7
Tixocortol pivalate (Pivalone®)	++	++	++	
Hydrocortisone butyrate (1 per cent alc)		++		
Betamethasone valerate (1 per cent alc)	++			++
Clobetasone butyrate (1 per cent alc)				++
Neomycin	++	++	++	+
Framycetin	++	+	++	
Gentamicin	++	+	++	
Quinoline mix	++		++	
Caine mix	++			
Balsam of Peru	++			
Fragrance mix	++			

Other allergens present in all of these cases of allergic contact dermatitis were neomycin and the related antibiotics framycetin and gentamicin. It has previously been noted that neomycin sensitivity is common in otitis externa (Jensen *et al.*, 1966; Kirton and Munro-Ashman, 1965) and as a consequence they suggested that these topical antibiotics should not be used in the treatment of otitis externa without a definite indication.

In conclusion, delayed-type hypersensitivity reactions to topical corticosteroids and other medicaments are relatively common amongst patients with chronic or severe otitis externa. We would suggest that, in addition to hypersensitivity reactions to other components of medicaments, allergy to corticosteroids be considered in patients with otitis externa who fail to improve or deteriorate following treatment. Referral to a dermatologist, at this stage, may allow a more accurate delineation of an individual patient's contact hypersensitivities. Subsequent topical therapy can then be prescribed in the knowledge that, even if not effective, it will not be exacerbating the original problem.

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