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Short Communication

Patch testing in allergic contact dermatitis

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Abstract

A deterioration in chronic inflammatory ear disease despite topical medication, or failure of the condition to improve with such treatment, should raise the possibility of allergic contact dermatitis. Allergen testing (patch testing) is the 'gold standard' method of identifying an agent causing allergic contact dermatitis.

We describe an ENT patch test series applied by our department as a screening device for this condition.

Key words: Allergy; Patch Testing; Otology

Introduction

A deterioration in chronic inflammatory ear disease despite topical medications, or failure of the condition to improve with such treatment, should raise the possibility of allergic contact dermatitis. Itching, otorrhoea and oedema of the external auditory canal during use of ear drops may suggest a contact allergy to the medication. This is a type IV hypersensitivity reaction, also known as a delayed-type hypersensitivity reaction. Previous studies have shown that this is a common condition, with an estimated prevalence of between 35 and 59 per cent.[1–4] It is thought that frequent use on inflamed skin plus an occlusive effect probably account for the high rate of sensitisation.[5]

The most important allergens in this setting are aminoglycosides, widely used topically in the treatment of otorrhoea and bacterial dermatoses. The widespread, prolonged use of these agents is responsible for the high rate of sensitisation against them. Neomycin and framycetin are the most important sensitisers among this group.[1–4] Because of this observation, some have objected to the use of neomycin in the treatment of otitis externa.[2,4] Cross-reactivity between neomycin and other aminoglycosides is common, with 63 per cent of patients with demonstrable hypersensitivity showing a response to two or more substances.[1] Cross-sensitivity is due to the close similarity of the chemical structures of these antibiotics.[6] The reaction time to patch testing of aminoglycosides almost always exceeds three days, which means that only the third reading (after seven days) allows a proper assessment of the patch test result. Systemic treatment with aminoglycosides may also lead to a reaction, due to cross-reactivity.[7]

The preservatives used in topical preparations (such as benzalkonium chloride, thiomersal, propylene glycol and sorbitol) may also be responsible for producing an allergic reaction,[8] as may steroid components (used in preparations such as Gentisone HC® drops, Betnesol® drops, Predsol® drops, Vista-Methasone N® drops and Tri-Adcortyl® cream). The use of topical astringents (such as aluminium acetate, acetic acid and antiseptics) provides an alternative, enabling avoidance of common allergens.

Current practice in patch testing

In cases in which the possibility of an allergic contact dermatitis has been raised, we traditionally refer to our dermatology colleagues, who then carry out allergen testing (patch testing). This is the 'gold standard' with which to identify an agent causing allergic contact dermatitis.[9,10] In this procedure, patches containing isolated compounds used in topical preparations are applied to the back of the patient (see Figure 1) for 48 to 72 hours. After two days, the patches are removed and the sites are graded for any reaction to the compounds. A further reading is then performed at four days.

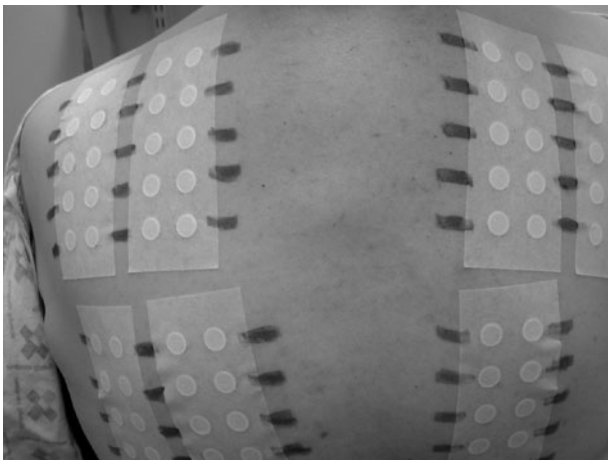

Fig. 1
Traditional patch testing set.

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TABLE I

COMMONEST ALLERGENS GIVING POSITIVE PATCH TEST REACTIONS IN OTITIS EXTERNA PATIENTS

Allergen	Source
Neomycin	Topical antibiotic
Gentamicin	Topical & systemic antibiotic
Framycetin	Topical antibiotic, cross-reacts with neomycin
Tixocortol pivolate	Marker for hydrocortisone allergy
Budesonide	Marker for hydrocortisone & triamcinolone allergy
Na metabisulphite	Trimovate® & Timodine®
Quinoline mix	Antiseptics clioquinol, Vioform® & chlorquinaldol
Parabens mix	Preservative in drops
Amerchol®	Lanolin derivative
Ethylenediamine	Tri-Adcortyl® preparations

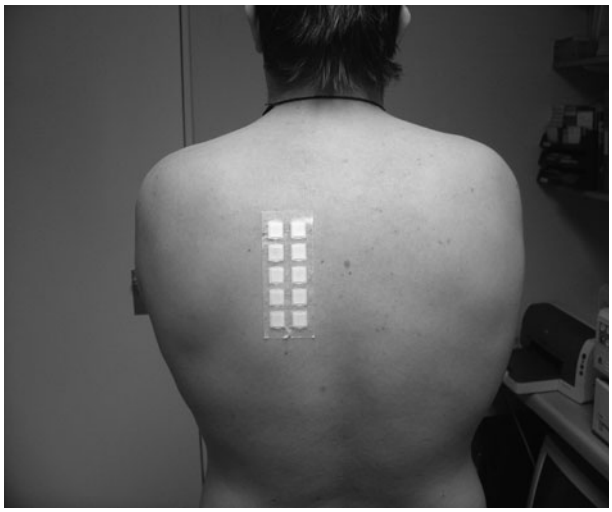

FIG. 2
ENT patch testing set.

Once an antigen has been identified, it is necessary to stop the use of topical preparations containing that compound. Simpler preparations, which do not contain common sensitisers (such as 1 per cent hydrocortisone ointment, Fucidin® H ointment and Terracorrtil® ointment), or astringents may be used while waiting for patch testing.[8]

How we do it

In order to avoid burdening the dermatology department with too many referrals, we identified the commonest allergens that gave positive reactions in otitis externa patients, to use as a screening series (Table I). This series was supplied in preloaded chambers for ease of application (Chemotechnique Diagnostics, Malmö, Sweden). This 'ENT' series was applied by ENT nurses (see Figure 2), and the results read by the consultant at day four (the patches were applied on Monday, removed on Wednesday and read on Friday). Any positive reactions were explained to the patient, and information provided on the avoidance of medicaments containing the sensitising agents.

This process was often sufficient to identify aggravating factors in otitis externa medications and to enable successful treatment with preparations unlikely to aggravate the condition. In a minority of cases, topical sensitivities to other chemicals, such as fragrances in shampoos, soaps and cosmetics, caused persistence of symptoms. If the initial patch testing and resultant treatment change did not yield the desired resolution of symptoms, then referral to the dermatology department for a more comprehensive battery of tests was considered.

Discussion

Doing 'in-house' patch test screening allowed our otolaryngologists to investigate many more patients and thus to prescribe with more confidence effective treatment for chronic otitis externa. Such screening had the clear advantage of allowing the patient to be investigated and treated within the single department, resulting in more convenient and, in some cases, faster service. Patch test screening also raised awareness of allergic contact dermatitis within the department, which we hope will result in more patients being investigated and treated promptly for contact sensitivities.

References

1 Fraki JE, Kalimo K, Tuohimaa P, Aantaa E. Contact allergy to various components of topical preparations for treatment of external otitis. *Acta Otolaryngol (Stockh)* 1985;**100**:414–18
2 Smith IM, Keay DG, Buxton PK. Contact hypersensitivity in patients with chronic otitis externa. *Clin Otolaryngol* 1990;**15**:155–8
3 Van Ginkel CJW, Bruintjes TD, Huizing EH. Allergy due to topical medications in chronic otitis externa and chronic otitis media. *Clin Otolaryngol* 1995;**20**:326–8
4 Holmes RC, Johns AN, Wilkinson JD, Black MM. Medicament contact dermatitis in patients with chronic inflammatory ear disease. *J R Soc Med* 1982;**75**:27–30
5 Wilkinson JD. The external ear. In: Champion RH, Burton JL, Ebling FJG, eds. *Rook/Wilkinson/Ebling Textbook of Dermatology*, 5th edn. Oxford: Blackwell Scientific Publications, 1992;2671–88
6 Forstrom Pirila V, Pirila L. Cross-sensitivity within the neomycin group of antibiotics. *Acta Derm Venereol Suppl (Stockh)* 1979;**85**:67–9
7 Guin JD, Phillips D. Erythroderma from systemic contact dermatitis: a complication of systemic gentamicin in a patient with contact allergy to neomycin. *Cutis* 1989;**43**:564–7
8 Sood S, Strachan DR, Tsikoudas A, Stables GI. Allergic otitis externa. *Clin Oto* 2002;**27**:233–6
9 Vanarsdel PP, Larson EB. Diagnostic tests for patients with suspected allergic disease. *Utility Limitations Ann Intern Med* 1990;**110**:304–12
10 Beltrani VS, Beltrani VP. Contact dermatitis. *Ann Allergy Asthma Immunol* 1997;**78**:160–73

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