

Allergic Contact Dermatitis Prevalence in Patients with Eczematous External Otitis

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Eczematous external otitis includes all forms of hypersensitivity of the canal skin. Contact dermatitis may be related to eczematous external otitis.^{1,2} Eczematous external otitis can be an allergic reaction to earrings, eyeglasses, matches, lotions, drugs, shampoo, hair dye, nail polish, earphones or hearing aids and foods, but the frequency of these reactions is not really known.³⁻⁶

Eczematous external otitis may result in chronic changes characterized by thickening of the skin, and even stenosis of the external canal. The chronic stage may be troublesome because of periods of uncomfortable itching and the tendency of the patient to resort to scratching, thus causing further irritation.^{7,8}

Eczematous external otitis tends to be chronic or recurrent. Each episode of otitis makes the ear more susceptible to future attacks. In time, the ear usually loses this sus-

SUMMARY Eczematous external otitis, because of its basic allergic nature, tends to be chronic or recurrent. The purpose of our study was to investigate the association between allergic contact dermatitis and chronic eczematous external otitis. Sixty-six patients with eczematous external otitis and 48 healthy volunteers were included in this study. All the patients were tested with an epicutaneous patch test. In the study group, the average recurrent attack rate was 6.1 ± 1.5 (between 4-9 times during the last year) in the patch test positive eczematous external otitis patients, and 4.9 ± 1.3 (between 4-8 times during the last year) in the patch test negative patients ($p = 0.002$). The epicutaneous patch test was positive in 19 (28.8%) out of 66 cases with chronic eczematous external otitis, and in 3 (6.3%) out of 48 cases in the control group. The difference between the two groups was statistically significant ($p = 0.003$). The most common reactions were due to neomycin sulfate and potassium dichromate in this study. These results suggest that, in some cases eczematous external otitis may be considered as a form of delayed type hypersensitivity to allergen stimuli. Patients suffering from eczematous external otitis symptoms should be investigated for allergens.

ceptibility, probably because of lessening of the allergic response.^{7,9}

The purpose of our study was to investigate the association between allergic contact dermatitis and chronic eczematous external otitis.

MATERIALS AND METHODS

Sixty-six patients with chronic eczematous external otitis were included in this study, at the

Süleyman Demirel University, School of Medicine, Departments of Otorhinolaryngology and Dermatology. Otomicroscopic examination findings were erythema of the ear canal and different degrees of swelling of the ear canal with or without discharge. Patients rarely complained of pain and hearing loss.

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Physical examinations revealed no eczematous skin lesion in other areas. An epicutaneous prick test (Multitest; Center Laboratories, Port Washington, NY, USA) was performed on all patients. The test allergens were supplied in 1:10 w/v strength with 50% glycerine as preservative. Fifty percent glycerine was used as negative control. A special applicator soaked into the dipwell tray of allergens was administered on the flexor surface of the forearm. The test was assessed at 20 minutes thereafter. The exact size of the wheal was measured and recorded. A growth of 3 mm in diameter in excess of the negative control was considered a positive result, since this diameter provides acceptable sensitivity (75–95%) and specificity (30–60%).¹⁰⁻¹² A steroid cream was applied to the test area to stop further reactions after the assessment of the test. The epicutaneous prick test for common inhalants and food allergens was negative in both groups.

Forty-eight healthy volunteers who were staff in our hospital were included in the control group. The control group was non-allergic as judged by negative skin responses to the common allergens, as well as personal medical history and physical examination.

Patients with allergic rhinitis and atopic dermatitis were excluded from the study. Patients with furunculosis or fungal infections were excluded, as well as patients with fever, perichondritis, perforated eardrums or infections secondary to otitis media. Patients who had received topical eardrops, systemic antibiotics, antihistamines, oral corticosteroids, or oral and nasal decongestants during the last

two months were also not included in our study.

Epicutaneous patch test

All the patients were tested with an epicutaneous patch test, using the European Standard series of allergens (Stallergenes SA, France). Testing and reading were performed according to international standard procedures. The allergens were applied to the subject's back for 48 hours with Finn Chambers (Epitest, Ltd Oy, Tuusula, Finland). Readings were made at 48 and 72 hours. Erythematous papules and vesicles with edema were indicative of allergy.

Statistical analyses were performed by Fisher's exact chi square (χ^2) test and unpaired t-test.

RESULTS

The study group included 66 patients with chronic eczematous external otitis (25 males and 41 females). The age ranged between 17-59 years (average, 37.7 ± 11.6). The control group consisted of 18 males, and 30 females. The age ranged between 18-53 years (average, 36.1 ± 9.6). There was no significant difference between the two groups regarding age and sex ($p > 0.05$). In the study group, the average recurrent attack rate for the

patch test positive eczematous external otitis patients was 6.1 ± 1.5 (between 4-9 times in last year), and 4.9 ± 1.3 (between 4-8 times in last year) for the patch test negative patients ($p = 0.002$).

The epicutaneous patch test was positive in 19 (28.8%) out of 66 cases with chronic eczematous external otitis, and in 3 (6.3%) out of 48 cases in the control group (Table 1). The difference between the two groups was statistically significant ($p = 0.003$). There were 31 positive reactions in the study group, and 5 positive reactions in the control group. The list of allergens used for contact dermatitis is given in Table 2. The most common reactions were due to neomycin sulfate and potassium dichromate in this study. Totally, neomycin sulfate as a topical drug was allergenic in 11 patients (35.5%), the other allergens were chemical agents (64.5%) (Table 2).

DISCUSSION

Eczematous external otitis is perhaps the most difficult to treat of all forms of external otitis because the provocative agents usually remain undiagnosed. Once the canal skin has become a target tissue, allergens other than the original sensitizing agent may provoke an episode of external otitis, thus producing an

Table 1 Patch test results in the two study groups*

	Positive patch test	Negative patch test
Eczematous external otitis	19 (28.8%)	47 (71.2%)
Control	3 (6.3%)	45 (93.7%)

*There is a significant difference between the two groups according to Fisher's exact chi square (χ^2) test ($p = 0.003$).

Table 2 Distribution of common allergens

Allergen	Eczematous external otitis	Control
Neomycin sulfate*	11	
Potassium dichromate**	6	
Formaldehyde**	4	2
Nickel sulfate**	3	1
Cobalt chloride**	3	1
Lanolin**	2	
Fragrance mix**	2	1

*Topical drugs (35.5%), **chemical agents (64.5%).

extremely chronic and recurrent disease.^{9,13} Contact allergy is considered to be a form of delayed type hypersensitivity, and is orchestrated by T lymphocytes.¹⁴ Although the most superficial layers of keratin tend to be shed laterally towards the opening of the canal in the healthy ear, this mechanism is disrupted during otitis externa, where the lesion consists of dermatitis of varying degrees.^{13,15}

Some studies reported that allergic contact dermatitis was diagnosed in 40-58% of patients suffering from otitis externa.^{2,4} Pigatto *et al.*¹ established this ratio to be 23.5%, which is much lower than in other studies. Hillen *et al.*² showed that chemical agents were the most common allergens, followed by topical drugs. Fraki *et al.*⁴ determined that the most common sensitizing agents were topical drugs and the preservatives of topical otic preparations. In these studies the patients suffering from otitis externa were not compared to normal subjects. In our study, allergic contact dermatitis was diagnosed in 28.8% of the patients suffering from otitis externa. They had signifi-

cantly more positive epicutaneous patch tests than the control group. We determined that the commonest allergen group was chemical agents (64.5%), followed by topical drugs (35.5%). The incidence, which we observed, was lower than that of Hillen *et al.*², Rasmussen³ and Fraki *et al.*,⁴ but higher than that of Pigatto *et al.*¹ In our study, the most common allergens were chemical agents similar to the study of Hillen *et al.*² They found nickel sulfate and inhalants as the most common chemical allergens, unlike in our study, where potassium dichromate was the most common allergenic agent (Table 2).

Whereas chemical agents were the most common allergens as a group, neomycin sulfate was the single commonest sensitizing agent in this study. In some studies, topical drugs were found to be the commonest sensitizing agents.^{1,2} This may be due to their more frequent use in these countries. The incidence of ototopical drug hypersensitivity may increase, especially with respect to the more frequent use of topical antibiotics such as neomycin sulfate in our country.

These results suggest that allergic contact dermatitis seems to facilitate eczematous external otitis, or affect the external auditory canal as a 'shock organ'. Therefore, in some cases, eczematous external otitis may be considered as a form of delayed type hypersensitivity to allergen stimuli.

The present study demonstrated that allergic contact dermatitis might be a related factor in chronic eczematous external otitis patients. Although contact dermatitis is rare, it should be considered when an external otitis becomes chronic and itching and has been unsuccessfully treated for a long time. The most important factor in the treatment of allergic diseases is identifying and removing the irritant or allergen. Therefore it is our opinion that patients suffering from these eczematous external otitis symptoms should be investigated for allergens. An epicutaneous patch test using compounds of topical preparations, cosmetics and earrings should be done in cases of prolonged or treatment resistant external otitis.

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