

Allergic Contact Dermatitis Prevalence in Patients with Otitis Externa

PAOLO DANIELE PIGATTO¹, ANDREA BIGARDI¹, AGOSTINA LEGORI¹, GIANFRANCO ALTOMARE¹ and LEONARDO TROIANO²

¹2nd Department of Dermatology, University of Milan and ²Department of Otolaryngology, University of Milan, Milan, Italy

A statistical analysis of the relationship between otitis externa and various clinical and etiological variables was carried out in 64 patients. Between 1988 and 1989, true eczema of the auditory canal was found in 43 of the 64 patients seen sequentially. 23.5% of all the patients found to have dermatitis could be regarded as having allergic contact dermatitis and the allergen identified. This incidence is less than the 40% and the 58% found in other previous studies. We did not find any specific difference in sex and age between the allergic and non-allergic groups. In the allergic group, topical drugs were the commonest sensitizing agents, followed by chemicals and resins found in the ear prosthesis. Twenty-one patients with negative patch tests were classified as seborrheic dermatitis and 11 as atopic dermatitis. The other 19

patients, who were discharged before patch testing, were diagnosed as having psoriasis (8) or chronic bacterial (6) or fungal infections (5), without true blister reaction. We think that accurately selected series must be used for these studies because of the low incidence of allergic contact dermatitis.

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P. D. Pigatto, 2nd Department of Dermatology, University of Milan, Via Pace, I-90122 Milano, Italy.

External otitis can be caused by endogenous (constitutional, familial), exogenous (physical, chemical, bacterial, mycotic) or unknown factors. Occasion-

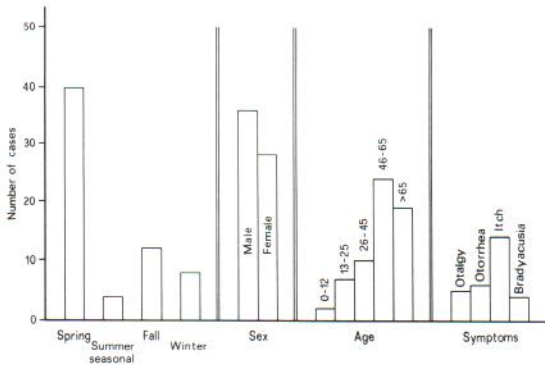


Fig. 1. Distribution of occurrence of external otitis regarding different seasons, sex, ages and symptoms.

ally external otitis can be an allergic reaction to ear-rings, eye-glasses, matches, lotions, drugs, shampoo, hair dye, nail polish or earphones, hearing aids, but the frequency of these reactions is not really known (1-6). Since the data in the literature are often contradictory, we decided to make a study of the etiological and clinical aspects of external otitis.

MATERIALS AND METHODS

Between November 1988 and November 1989, we studied 64 consecutive patients with external ear and external auditory canal problems, mostly otorrhea and pruritis, sometimes untreated and sometimes previously treated by otologists.

Anthropometric data, the time of the year when the affection appeared, the prevalent symptoms, whether or not local treatment had been applied and whether or not hearing aids were used were all recorded.

All patients were seen by an otorhinolaryngologist and a dermatologist who made bacteriological, mycological and allergy investigations. Material was obtained on sterile swabs. For bacteria, it was spread onto plates containing McConkey agar, incubated for 18-24 h at 37°C and the microorganisms isolated and identified by the following techniques: Streptococci by Gram stain, hemolysis, bacitracin test and optokin test, serological test for classification according to Lancefield (Wellcome); Staphylococci by Gram stain, catalysis, mannitol fermentation, API-STAF; Gram-negative bacteria by API-20 E. For mycetes, swab material was diluted in physiological saline, observed fresh and then cultured in Sabouraud agar at 30°C.

All the patients were tested with patch tests, using the standard allergy series GIRDCA (Italian Research Group for Environmental Contact Allergies) (7) and sometimes with topical preparations used as such.

An array of 31 specific otorhinolaryngologic haptens was prepared after a marketing study of the use of the main otologic substances in Italy. The haptens were: 2% TEG-MA, 2% methylmethacrylate, 2% EGDMA, 2% tetra-

caine, 2% bisphenol-A-dimethacrylate, 5% prednisolone, 1% pyrrolnitrine, 1% econazole nitrate, 1% clotrimazole, 0.25% nitrofurazone, 25% hydrocortizone, 5% sulfathiazole, 3% polymixin B sulfate, 5% tetracycline hydrochloride, 25% gentamicin sulfate, 2% streptomycin sulfate, 2% procaine hydrochloride, 2% lidocaine hydrochloride, 10% sulfanilamide, 10% dimethylhydroxyethylenurea resin, 5% phenolformaldehyde resin, 1% N-cyclohexylbenzothiazolyl-sulfonamide, 10% sulfamide mixture, 5% glycols, 1% penicillin, 3% chloramphenicol, 20% cetylstearyl alcohol, 5% benzyl alcohol, 10% polysorbate 60, 5% sorbitan monostearate, 4% oil of sweet almonds. The methods of testing and reading are the International Standard procedures. In short, the haptens were diluted in Vaseline or in water and applied to the subject's back for 48 h with Finn Chambers. Readings were made at 48, 72 and 96 h. A positive reaction was one with erythema, edema and/or blistering. Erythema alone was regarded as a doubtful reaction.

RESULTS

Fig. 1 shows the distribution for appearance of the external otitis at different times of the year and the distributions according to sex, age, and symptoms. It appeared most frequently in the springtime and there was a marked prevalence of the problem in patients older than 45 years. This should be interpreted in the light of the combination of this form with flare-ups of chronic otitis, which are more frequent in patients over 45 years of age.

The cases that occurred in the younger patients are partly related to athletic activities in the 13- to 25-years-olds and to the larger numbers of episodes of rhinopharyngitis in the 0- to 13-years olds, with possibility of otitis or otomycosis.

The major symptom causing the patient to visit the doctor was that itching of the dermatitis of the auditory canal and the outer ear, along with otor-

Table I. Pathologies of external auricular canal

Diagnosis	No. of patients
<i>Eczematous dermatitis</i>	
Seborrheic dermatitis	21
Atopic dermatitis	11
Contact dermatitis	
allergic	11
irritative	2
Microbic dermatitis	6
<i>Non-eczematous dermatitis</i>	
Psoriasis	8
Otomycosis	5

Table II. Bacterial and mycotic agents – microbial dermatitis

	Total no. cases N	No. cases
Bacterial		
<i>Staphylococcus aureus</i>	10	3
<i>Staphylococcus epidermidis</i>	5	1
<i>Streptococcus pyrogenes</i> A	6	1
<i>Pseudomonas aeruginosa</i>	9	1
<i>Clostridium perfringens</i>	1	–
		No. otomycosis
Mycotic		
<i>Aspergillus flavus</i>	2	2
<i>Aspergillus niger</i>	1	1
<i>Candida albicans</i>	1	1
<i>Pityrosporum ovale</i>	7	

rhea (Fig. 1). For ear-aches, 68% of the subjects first tried traditional remedies, taking analgesics or plugging the ear with cotton wool soaked with drops, which provided an excellent environment for the development of eczematous dermatitis. Deafness did not appear to worry the patients, who would rather ask that words be repeated or radio or TV or record player be turned up as high as possible, rather than go to the doctor.

As for any possible correlation between occurrence of dermatitis in the external auditory canal and the local therapy tried before going to the doctor, 28 of 64 patients said they had used topical treatments and 36 had not used either ointments or drops. Four other patients wore intra-auricular hearing aids.

In Table I the patients are distributed according to the diagnosis of the type of auditory canal disturbance. Most of them had seborrheic eczema, in which *Pityrosporum ovale* was frequently found and there were many bacterial superinfections. Eleven subjects had eczematous otitis associated with the clinical manifestation of atopic eczema. These eczemas appear to be connected with the extreme irritability of atopic skin, which often is spontaneously lesioned. Pure microbial dermatitis is rare. The most frequently isolated bacteria were *Staphylococcus aureus*, and there were definitely some *Pseudomonas aeruginosa*. If we combine the data in Table II with the results of the cultures, we can correlate the frequencies of the different microorganisms responsible for the bacterial or mycotic infections with the clin-

ical diagnoses. Twenty-two cases had no bacterial or mycotic agents superimposed on pathologies. There were 25 cases of microbial superinfection, 3 with psoriasis, 10 with seborrheic dermatitis, 6 with atopic dermatitis and 6 with contact dermatitis. Four patients had mycotic infections, mostly aspergillus, with candidiasis second. These cases were found to be isolated, not associated with other pathologies and were therefore diagnosed as otomycosis.

Among the cases with contact dermatitis, 2 were of the irritative sort, due to long-term use of hearing aids. Eleven of 64 patients had allergic contact dermatitis. All had, as expected, iatrogenic allergic dermatitis (Table III). The substances most frequently involved in the allergic reactions were antibiotics such as neomycin sulfate and gentamycin, preservatives such as methyl-*p*-oxy-benzoate, excipients such as propylene glycol and resins such as methylmethacrylate. Only one patient, who had negative responses in the tests with the standard series, had a positive response to the preparation he used (Cerumenex).

DISCUSSION

Some of our data agree with those of other studies (4–6). Sex and age were not found to be important epidemiological factors, and even the seasonal effects were not clearcut. The main peak occurred in the springtime, in close association with the atopic disturbances that are active in that period, though, this finding is not a direct indication of atopy. Atopic dermatitis was one of the principal causes of external otitis in our patients. We also saw a considerable number of cases of seborrheic dermatitis, characterized by an erythematous–desquamatory eruption, with a tendency to develop in the auditory canal. Seborrheic dermatitis was often associated in our

Table III. Substances causing eczematous reactions in our patient population

Substance	Number total
Neomycin sulfate	3/13
Gentamycin	1/13
Methyl- <i>p</i> -oxybenzoate	2/13
Propylene glycol	2/13
Methylmethacrylate	2/13
Ethylenediamine	1/13
Procaine	1/13
Cerumenex	1/13

patients with increased susceptibility to bacterial infection, but there is no evidence that these organisms are of primary importance in this condition.

In patients with so-called microbial eczema of the external auditory canal, we most frequently found *Staphylococcus aureus* and *Pseudomonas aeruginosa*, as well as in other previously diagnosed dermatitis. Therefore, we feel that microbial eczema is not an isolated entity, but is a particular type of skin reaction frequently superimposed on an exogenous eczema as well as mycotic external otitis which is a condition where the etiological importance of the mycetes is primary: this is a very rare condition, viz. 5 of 64 cases (Table II), whereas the other are superimposed fungi. Allergic contact dermatitis occurs with a frequency equal to that of atopic dermatitis. Our frequency was 23.5%, much lower than the 40–58% reported for other studies by non-Italian groups (4, 5), but higher than those of other Italian investigators (6). Of 64 patients, 2 had irritative contact dermatitis from a hearing aid. The 11 patients with positive patch test reactions were frequently allergic to aminoglycoside antibiotics (which have been reported for years to be responsible for ACD, but are still being sold), to excipients, to preservatives and to the resins of which the hearing aids are made.

Prescription of topical otologic preparations causes a fair number of sensitizations. We wish to emphasize that of the otological preparations we studied, only five warn of possible side effects: two warn of possible ototoxicity of neomycin and three others warn of possible sensitization. The others are entirely over-the-counter products, without any informational leaflet enclosed.

Since our data indicate clearly that allergic contact dermatitis is less prevalent than the other types, we

are less disturbed than we might otherwise be about the common procedure of prescribing combinations of topical preparations. Although contact dermatitis is rare, it should be suspected when the external otitis is chronic and itching and has been unsuccessfully treated for a long time.

Although once in a while a patch test with the product itself may give a positive result (1 in 64 in our study), it often gives negative results because the substances are present in the preparation are at a lower concentration than those useful for the diagnostic test. Therefore, we think that an investigation with a series of appropriate haptens combined with careful study of the commercial preparations and a thorough investigation of skin allergies would be useful for clarifying this pathology that lies at the border between two types of specialty and should be undertaken by a taskforce of dermatologists, ear specialists and microbiologists.

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