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Middle-ear pressure changes in relation to recurrent otitis externa

by

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Otitis externa is a common condition in Egypt. The causes of recurrence after treatment or of chronicity have been studied by many authors. Normally, the direction of the outer part of the canal, the acidic nature of the wax (Fabricant and Perlstein, 1949) and presence of hairs protect the external auditory canal from infection. Excessive mechanical removal of the wax may decrease resistance and increase the possibility of penetration by bacteria (Senturia, 1957). On the other hand, a build-up of wax may cause an accumulation of water within the external auditory canal during bathing or swimming, and may thus lead to recurrent otitis externa (Peterkin, 1974). The migration of epithelium outwards from the tympanic membrane along the external auditory canal (Alberti, 1964) is impeded by a constant negative middle-ear pressure (Morrison and Mackay, 1976); and that is why, in most cases of secretory otitis media, there is an accumulation of wax and debris in the canal.

The present work has been done to assess the effect of negative middle-ear pressure on the development of recurrent attacks of otitis externa, and we have tried to determine the role of negative middle-ear pressure among other predisposing factors in otitis externa; we have also studied the effect of restoring the middle-ear pressure on the condition of the external ear.

Material and Method

Twenty-eight patients with recurrent attacks of external otitis (with ages ranging from five years to 48 years) were chosen; none of them was suffering from any systemic disease, e.g. diabetes or uraemia. They were subjected to cleaning of the external canal, clinical examination of the ear, culture and sensitivity testing for the discharge (to exclude fungus infection) and tympanometry; cases with negative middle-ear pressure were treated according to the cause. They were all followed up for at least five months, to assess any recurrence of the external otitis.

A control group of 20 patients (aged from eight to 45), who did not suffer from ear trouble, were examined to exclude any ear disease. They too were subjected to tympanometry, to estimate their middle-ear pressures. For patients in the first group, the middle-ear pressure was estimated twice (with an interval of two weeks between the two tests) before any attempt was made to correct the middle-ear pressure, to be sure that it was constantly negative. The same conditions were observed for individuals in the control group.

Results

In the first group of 28 patients with recurrent attacks of otitis externa, all of them had had pain and discharge from the ear during the attacks, and the skin was macerated and congested. On measuring the

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middle-ear pressure, seven (15 per cent) had normal middle-ear pressure; 15 patients (54 per cent) had mildly negative pressures, ranging from −100 to −200 mm. H_2O; and six patients (21 per cent) showed highly negative pressures, with signs of secretory otitis media. In four patients, secretory otitis media was found in one ear only, with unilateral external otitis on the same side; in the other two patients, with bilateral secretory otitis media, chronic otitis externa was also bilateral.

In the 15 patients with mild negative pressures, thorough examination and investigations were done to determine the cause of the negative pressure: in six patients, it was due to adenoids, and in these children adenoidectomy was done; in two cases submucous resection of the septum was needed; in five cases, anti-allergic treatment was given; and in the remaining two cases, antral lavages were carried out several times. In 12 of these patients, the middle-ear pressure returned to normal after treatment, and simultaneously the condition of the external auditory canal improved greatly, and the typical attacks of otitis externa disappeared; in only three cases did the itching in the ear remain.

In the six cases with secretory otitis media, medical treatment was given until the acute external otitis had subsided; then myringotomy and the insertion of a ventilation tube was done for every diseased ear. Follow-up of the cases for five months revealed that the recurrent attacks of external otitis had ceased.

In the control group, tympanometry revealed normal middle-ear pressures, ranging from −50 to +50 mm. water; on repeating the test two weeks later, the middle-ear pressures were unchanged.

Discussion

From the results reported herein, we conclude that a constantly reduced middle-ear pressure should be considered to be one of the predisposing factors in the development of recurrent attacks of otitis externa; in the present series, it was found to be of importance in no fewer than 18 (64 per cent) of 28 patients. Furthermore, correction of the middle-ear pressure in those 18 patients improved the condition of the external ear greatly. By contrast, in the three patients in whom the middle-ear pressure remained negative, there was no improvement in their external otitis, as their recurring attacks continued to recur. Abnormal desquamation of the epithelium and accumulation of wax, which are amongst the effects of a negative pressure in the middle-ear, decrease the resistance of the skin; and the accumulation of wax and debris keeps water in contact with the skin for a longer time (Peterkin, 1974). Repeated attempts by the patient himself to remove wax and debris may further traumatize the canal skin, thus leading to otitis externa (Morrison and MacKay, 1976). Hence, in cases of resistant or recurrent external otitis, it is advisable to exclude a reduction of middle-ear pressure, as this may be an important underlying factor.

Summary

Middle-ear pressure was estimated in 28 patients who suffered from recurrent attacks of bacterial otitis externa, but without systemic disease. The middle-ear pressure was found to be normal in seven cases, mildly negative in 15 cases, and severely reduced in six cases. Restoration of the middle-ear pressure greatly improved the condition of the external ear in most cases.

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