

Short Communication

Earwax and level of paralysis

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Study design: Inception cohort.

Objectives: The clinical impression that earwax is uncommonly frequent among spinal cord injury patients with high levels of paralysis was tested.

Setting: Veterans Administration Hospital, USA.

Methods: A cohort of 15 chronically paralyzed patients, motor complete, living as residents in a long-term care facility was offered monthly irrigations of the ears for removal of wax over a 6-month period. The number of requests was tabulated. All ears were examined once on a single day to determine point prevalence. The accumulated wax graded as absent or small, moderate or large.

Results: Two patients with C2 lesions, aged 37 and 52 years and paralyzed 15 and 16 years, were compared with 13 patients at C4–T6 aged 44–78 years, median 62 years, and paralyzed 2–33 years, median 24 years.

Over a 6-month observation period, 10 irrigations were requested by the C2 patients and three by the C4–T6 patients. The reasons were hearing loss. Wax was found and removed, and symptoms were relieved in all instances, $P < 0.001$. The spot survey revealed earwax of moderate or large amounts in four of four C2 patient ears and in two of 24 C4–T6 patient ears, $P = 0.001$.

Conclusion: Patients with C2 tetraplegia accumulate more earwax and request its removal more often than patients with lower levels of paralysis.

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Keywords: spinal cord injury; earwax; cerumen; sebum; tetraplegia; quadriplegia

Introduction

Earwax is an occasional problem for the able-bodied, a greater problem for the elderly and individuals with mental retardation,^{1,2} and, it appears, for certain individuals with spinal cord injury (SCI). The following is an experience with resident in-house SCI patients.

Methods

During a tour of duty at a long-term health-care facility for spinal cord injured patients, monthly irrigations of the ears for wax control were offered to all patients. There were 15 patients, all with motor complete paralysis. These were divided, in retrospect, into Groups A and B. Group A consisted of two patients with C2 lesions, 37 and 52 years of age, and paralyzed 15 and 16 years. Group B consisted of 13 patients with lesions at C4–T6, median C6, aged 44–78 years, median 62 years, and paralyzed 2–33 years, median 24 years. The number

of monthly irrigations requested by the patients in each group was recorded.

After the 6-month survey, the patients were examined for earwax on a single occasion just prior to the next scheduled monthly irrigation. The accumulation of wax was graded as 1 for absent or small amounts and as 2 for moderate to large (occluding) amounts. The prevalences of Grades 1 and 2 were tabulated for Groups A and B.

Groups A and B were compared for the number of requested treatments of earwax by χ^2 analysis. The groups were also compared for the prevalence of earwax by the Fisher exact test. The software Primer of Biostatistics was used for all calculations.³

Results

The patients requesting irrigations did so with the complaint of hearing loss usually and discomfort occasionally. Otoloscopic exam revealed earwax in all such instances. The amount of wax removed varied from voluminous casts of the ear canal to small chips. A few

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Table 1 Frequency of earwax removal in spinal cord injury patients by level of paralysis^a

Level of paralysis	Number of patients	Months without irrigation	Months with irrigation	Months total
C2	2	2	10	12
C4–T6	13	75	3	78

$\chi^2 = 53$, $P < 0.001$

^aWe have encountered another C2, motor complete, patient as an outpatient. He has independently been requesting monthly irrigation of his ears

cases of earwax were inspissated. Group A patients required removal of earwax considerably more frequently than Group B, see Table 1. The prevalence for Grade 2 earwax accumulation was four of four ears in Group A and two of 24 ears examined in Group B (one of the Group B patients had died), $P = 0.001$.

Discussion

The greater earwax accumulation in the C2 patients could not be correlated with older age or greater duration of paralysis. But dysreflexia, although not quantified in this cohort, was conceivably a factor. Sweating of the face is a component of the dysreflexic reaction⁴ that occurs frequently – daily or several times a day – in some individuals with SCI. The sebaceous and the modified sudoriferous glands of the ear canals that together produce cerumen and are responsive to noradrenaline⁵ may participate, it is suggested, in dysreflexic sweating. Alternately, facial blood flow, and conceivably wax production, may be increased with the patient lying supine because of the impaired defense of the circulation against gravity.^{6,7} Serial comparisons between severity of paralysis and position, facial blood flow, blood pressure, sweating, and cerumen accumulation would be required to test these suggestions.

On a therapeutic note, the flushing out of earwax with water after treatment with heavy mineral oil overnight was generally effective. Interestingly, water has been shown to disperse wax better than a variety of commercial oils *in vitro*.⁸

Conclusion

Regardless of explanation, it can be concluded that earwax, a frequent cause of hearing loss, is a common complication of high tetraplegia, motor complete.

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