

Ear Wax and Hearing Impairment in Children in Nepal

Abstract

The presence of wax is a common finding during ear examination of children and it is one of the main causes of avoidable hearing impairment in children. The objective of this study was to find out the prevalence of wax in ear and evaluate the hearing loss in school-aged children. This is a cross sectional school-based study conducted over a four-year period. Children aged 5-16 were examined by otoscope and pure tone hearing thresholds were obtained at 0.5, 1, 2, and 4 kHz frequencies. A total of 53,970 children from 312 schools of Kathmandu valley were screened. The prevalence of ear wax was 34.64% (n=18697) and hearing impairment associated with wax was 0.88% (n=475). Ear wax and associated hearing loss is a common problem in Nepalese children. Lack of trained personnel and the costs involved in its treatment makes ear wax a big challenge for Nepal's rudimentary health care system.

Keywords: Cerumen, children, ear wax, hearing impairment, Nepal

Introduction

Ear wax is produced by the sebaceous and modified apocrine sweat glands of the outer cartilaginous part of the ear canal. It helps in maintaining the lubrication of the canal and has antimicrobial properties.^[1] Repeated use of cotton buds, prolonged use of hearing aids, and an abnormal ear canal increase the risk of wax impaction. While often harmless, if impacted, it can sometimes cause symptoms such as earache, tinnitus, dizziness, and hearing loss (HL).

Ear wax is the most commonly observed external ear pathology, and about 2%–6% of the general population suffers from impacted wax.^[2] It is one of the main causes of reversible HL.^[3] Depending on the wax impaction, hearing impairment can range from 5 to 40 dB HL.^[1,4] In children, HL of even mild degree can lead to delayed language development and educational progress and should therefore be managed in time.

Management of ear wax adds significant burden on the healthcare services of even developed countries.^[5] Management of wax in a country like Nepal, where the healthcare infrastructure is limited both in scope and resources, poses a bigger challenge. Nepal is one among the least developed countries and is ranked 144th out

of 188 nations by the United Nations. In Nepal, no study covering a large pediatric population has been carried out to ascertain the status of wax and HL due to wax impaction. Hence, the main objective of this study was to determine if ear wax is prevalent in schoolchildren and to find out the hearing impairment associated with ear wax.

Methods

This is a cross-sectional school-based study conducted over a 4-year period from 2016 to 2019 in community schools of Kathmandu, Lalitpur, and Bhaktapur districts of Kathmandu valley. A total of 312 schools from these districts that provided written consent to conduct the study were included. Consent to conduct the study was obtained in writing from the educational authorities of the concerned district and from individual schools. All the children from grades 1–10, aged between 5 and 16 years, who were present in school on the day of the screening were included. The schools that did not consent to the study were excluded. Children with middle ear pathologies such as acute otitis media, chronic otitis media, and otitis media with effusion, as well as children who had a history of ear surgery and children with sensorineural HL were also excluded from the study.

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The examination procedure was explained to the children and their parents. Sociodemographic details and a brief history were documented. Ear examination was carried out by a physician using Mini-Heine Otoscope, Welch Allyn, Germany. Ear wax was diagnosed as a presence of wax occluding the external auditory canal preventing the view of the tympanic membrane. The audiometry was carried out by an audio-technician using Arphi Proton DX-3, SRK Meditech, India in a separate quiet classroom. The room where audiometry was carried out was considered silent if the examiner with a normal hearing could hear 10 dB HL sound at 1000, 2000, and 4000 Hz frequencies. HL was defined as a pure tone average of four frequencies 0.5, 1, 2, and 4 kHz greater than 25 dB HL in one or both ears.

Results

Of the 53,970 children in the study, 16,042 were from Kathmandu, 19,788 from Lalitpur, and 18,140 from Bhaktapur district. Ear wax was found in 18,697 (34.64%) children: 9141 (48.90%) unilateral and 9556 (51.10%) bilateral; 10,434 (55.80%) were boys and 8263 (44.19%) girls. The majority of the children (10,924, 58.42%) with ear wax were aged 11–16 years and 7773 (44.19%) of children were in the 5–10 years of age group.

Hearing impairment was seen in 475 (0.88%) children with ear wax, and the average impairment was 27.5 dB HL. Impairment was more prevalent in the older children aged 11–16 years, and it was mostly of mild degree as found in 404 (85.05%) children. 71.78% of children with hearing impairment belonged to ethnic minority communities, while 28.21% belonged to the privileged class. Most of the children considered ear picking and recourse to home remedies as normal and in accordance with traditional customs. Sociodemographic variable of the children with ear wax and HL are presented in Table 1.

Discussion

Ear wax is one of the most common pathologic ear findings seen in clinical practice. In our study, the prevalence of ear wax in schoolchildren was 34.64%. Other studies conducted among Nepalese children have reported a prevalence of 25.14%^[6] and 62%.^[7] These are the study results of ear disease surveys done on small populations. Neither of them studied the hearing impairment caused due to wax impaction.

Ear wax impaction is considered more prevalent in economically deprived populations in developing countries than in developed countries. In the United Kingdom, about 2.3 million people suffer from ear wax,^[8] and in the United States, 12 million people visit hospital due to ear wax-related issues.^[9] In other developing countries, the high prevalence rates of ear wax impaction ranging between 23.4% and 52.6% have been reported.^[3,10,11] Few developing nations have reported low prevalence rates.^[12–15] The reason for ear wax being more

Table 1: Sociodemographic variables of children with ear wax with associated hearing impairment

Sociodemographic variables	n=475, n (%)
Sex	
Male	368 (77.47)
Female	107 (22.52)
Age distribution (years)	
5-10	182 (38.31)
11-16	293 (61.69)
Hearing impairment	
Bilateral	334 (70.32)
Unilateral	141 (29.68)
Right	90 (63.83)
Left	51 (36.17)
Degree of hearing impairment	
Mild conductive hearing loss	404 (85.05)
Moderate conductive hearing loss	71 (14.95)
Ethnic group	
Brahmin	98 (20.63)
Chhetri	36 (7.58)
Janajati	331 (69.68)
Madheshi	6 (1.26)
Dalit	3 (0.63)
Others	1 (0.21)
Habit of ear picking	
Yes	401 (84.42)
No	74 (15.58)
Habit of instillation of various homemade liquids	
Yes	318 (66.95)
No	157 (33.05)
History of hospital visits due to wax-related issues	
Yes	130 (27.37)
No	345 (72.63)

prevalent in this study could be because it was conducted in government-run schools of Kathmandu valley. Children who attend community schools are from economically deprived backgrounds, with the majority being children of migrant workers, daily-wage earners, and underprivileged ethnic minorities. We found that 71.78% of the children with ear wax with associated hearing impairment are those who belong to minority ethnic groups. Minja and Machemba found the prevalence of wax to be higher in rural schoolchildren and in children from lower socioeconomic status.^[10]

In our study, hearing impairment was found in 0.88% ($n = 475$) of children with impacted wax, and 404 (85.05%) of hearing impairment was of mild conductive type. Although less than one percent of children with impacted wax were found to have HL, the large number of those with impacted ear wax makes it a challenge for a developing country like Nepal. Ear wax impaction was found to be the most common cause of hearing impairment by many studies.^[3,10,12,13,15]

Although ear wax seems harmless, the sheer magnitude of this condition in terms of the numbers affected and the costs involved in its management render it a sizable burden on the resources of healthcare systems even in developed nations.^[8,5,15] In countries where there is a public health care system, family physicians play a key role in the management of wax.^[8] In Nepal, there is no national public healthcare system currently in place, and therefore, such a structure is absent. Ear wax is considered normal in traditional Nepali households, so very few seek medical help if a problem does arise. In our study, despite having problems related to ear wax, 72.63% of the children never visited a doctor for its management. In most cases, self-management of the ear wax was attempted by following customary traditional methods such as instillation of oil or other liquids to soften the wax and picking using sticks or metallic loops.

We found that there is a high prevalence of ear wax in children, but the prevalence of HL due to wax is relatively low as compared to other studies. In Nepal, the burden of chronic otitis media and associated HL is huge and its management still poses a bigger challenge for the prevention of deafness, especially in children. Training health personnel such as auxiliary health workers and health assistants in diagnosis and management of common ear problems can cost-effectively manage ear wax without adding extra burden to the already strained healthcare system. Similarly, creating awareness about ear wax and its possible complications among children and their parents through school-based ear health programs could prevent possible complications associated with ear wax impaction.

Conclusion

Ear wax is one of the most common ear problems observed in Nepalese children. Ear wax can cause hearing impairment if impacted.

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Conflicts of interest

There are no conflicts of interest.

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