

## ORIGINAL PAPER

SIGNIFICANCE OF EAR WAX IMPACTION  
IN SCHOOL CHILDREN

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## ABSTRACT

**Background:** The aim of the study was to determine the prevalence of school children with impacted ear wax.**Material and methods:** The subjects included representative sample of 1344 seven to ten years old school children attending I-IV grade of primary school in community Kalesija, Bosnia and Herzegovina. Methods were parental interview and otoscopy.**Results:** Three hundred and twenty eight children (24.4%) had ear wax impaction. There were not significant differences in prevalence of ear wax impaction in boys and girls. Use of cotton-tipped swabs did not caused production of more ear wax.**Conclusion:** Routine correct removal of ear wax is recommended because watchful waiting is possible erroneous and potentially dangerous.**Keywords:** *Ear wax (cerumen) impaction, children, cotton-tipped swabs.*

## INTRODUCTION

Ear wax (cerumen) is a mixture of secretory products of glands in the outer ear canal where it serves a protective function.<sup>1</sup> Around 1000-2000 glands of special cerumen producing type exist in the outer ear canal.<sup>2</sup> There are four types of cerumen: European, Vietnamese, dried Inuit and dry epithelium.<sup>2</sup> Some people have a completely clean ear canal without ever having them cleaned, yet other have excessive production of the earwax. Two populations are known to have a high incidence of impacted ear wax: individuals with mental retardation and the elderly.<sup>3</sup> In the elderly population, impacted cerumen is the commonest ear disease, occurring in 34.4% of population.<sup>4</sup>

Impacted cerumen is observed in children, as well.<sup>5</sup> Some of authors believe that large amount of cerumen is unlikely to be seen when otitis media is present.<sup>6</sup> Major sequelae of impacted cerumen are conductive hearing loss, which can be deleterious to linguistic, social and intellectual development.<sup>7</sup>

## METHODS

A sample of 1344 children (2688 ears) during October and November 2001, were examined to determine the prevalence of cerumen impaction by otoscopy. A representative sample of:

Grade 1 (first year school entry - age 7 years),  
Grade 2 (second year school entry - age 8 years),  
Grade 3 (third year school entry - age 9 years) and  
Grade 4 (fourth year school entry - age 10 years)  
children in rural area of Kalesija, near urban area of Tuzla, Bosnia and Herzegovina were surveyed (Table 1).

Methods were: otoscopy and parental interview. Only total obstruction of the outer ear canal by cerumen, visible by otoscopy, was considered as cerumen impaction. We interviewed parents of 324 randomly selected children with impacted earwax. Parental interview provided data about the frequency of the use of cotton-tipped swabs for outer ear toilet.

**Table 1.** The number of examined children

School grade	Male	Female
Grade 1	155	151
Grade 2	125	134
Grade 3	192	189
Grade 4	184	214
<b>Total</b>	<b>656</b>	<b>688</b>

## RESULTS

Three hundred and twenty eight children (24.4%) had total outer ear canal obturation by cerumen. Both ears were impacted by cerumen in 98 males (70.5%) and 112 females (59.3%). The number and percentage of children with impacted earwax according to sex is presented in the Table 2.

Parents used cotton-tipped swabs for routine cleaning of children's outer ear canal one time per week (aural hygiene after bathing) in 286 of interviewed cases (88.2%). One hundred and twenty one children of them (42.3%) had cerumen impaction, and others had not problems with cerumen impaction.

## DISCUSSION

Ear wax has been under investigation for different reasons (migration of people, occupational exposure, association with breast cancer, antimicrobial function, association with alkaptonuria, genetic dimorphism of ear wax and longevity).<sup>1,8,14</sup>

Cerumen impaction can affect up to 6% of general population,<sup>1,18</sup> and it is major cause of primary care consultation and common comorbidity in ENT patients.<sup>7,19</sup> It is a problem in whole world. In the United Kingdom, some 2.3 milion people suffer cerumen problems serious enough to warrant management.<sup>7</sup> Each week in the United States, approximately 150,000 cerumen removal take place.<sup>20</sup> A total of 181,000 Omani people were estimated to have impacted wax in the ear canal.<sup>10</sup>

Cerumen impaction is problem in children, too. In

literature, there are different data about the prevalence of cerumen impaction in children: 12.3%,<sup>21</sup> 15.7%,<sup>5</sup> 23%,<sup>23</sup> roughly a quarter,<sup>24</sup> 39.4%.<sup>25</sup> If we analyze the literature for prevalence and its relation to age, we can see that children in the first year of school have cerumen impaction from 11.9%<sup>6</sup> to 74/1000.<sup>11</sup> Impaction of cerumen appears in 14% of children in their second year of schooling.<sup>25</sup>

Some authors believe that there is a lower incidence of ear wax in children with otitis media. The speculated reason is that an inflamed eardrum contains ceruminolytic properties.<sup>6</sup> Impacted ear wax has been classified as an ear disease, and it can cause pain, itching, hearing loss or otitis externa.<sup>9</sup>

Impacted ear wax is reason for failure of different hearing conservation programs or ear screening programmes. About 45% of Indian preschool children (38.4% of Black, 49.9% of Indian) failed on outer ear tests.<sup>10</sup> Ear wax impaction was found in 20.45% of the rural school children and in 14.8% of the urban school children.<sup>5</sup> In a second study, cerumen impaction was found to be present in 35.86% of rural and 30.7% of urban population respectively.<sup>26</sup> The wax obstructing the tympanic membrane was found in 8.6% of the school children in Kenya, and there was an evidence of a relationship between hearing impairment and chronic suppurative otitis media in school children and wax obstructing the tympanic membrane.<sup>11</sup> Impacted ear wax was found to be the most common ear disorder amongst Nigerian school children (documented in 189 children – 52.6% of sample).<sup>13</sup>

It is clear that a great variability in the percentage of impacted cerumen exists among different reports. The reason for this can be explained by regional factors,

**Table 2.** The number and percentage of children with impacted earwax

	Male		Female	
	N	%	N	%
Grade 1	38	24.5	45	29.8
Grade 2	29	23.2	49	36.7
Grade 3	47	24.1	48	25.4
Grade 4	25	13.6	47	22.0
<b>Total</b>	<b>139</b>	<b>21.4</b>	<b>189</b>	<b>28.5</b>

but on the other hand, there is a difference between the prevalence of impacted ear wax in the children from the same regions (Africa). However, there is some consistency, which is in agreement with our findings, that impacted wax is more frequently seen bilaterally<sup>1</sup>, and that there is a gradual decline in prevalence with age.<sup>6,15</sup>

Our results are somewhat different from other papers when it comes to impaction of ear wax and frequency of use of cotton-tipped swabs,<sup>15</sup> but there are similar results reported by other authors.<sup>15</sup> We conclude that cotton-tipped swab use is not associated with a greater prevalence of cerumen impaction.

## CONCLUSION

Removal of ear wax is therefore essential since there is:

- A possibility to later skin reactions ranging from a mild eczema to acute furunculosis.<sup>17</sup>
- A possibility of existing middle ear problems (otitis media, hearing impairment).
- A possibility of failure of screening tests for hearing impairment.
- A possibility of use of removed ear wax in some diagnostic purposes.

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