Original Article

The Prevalence of Ear Disease in Sensorineural Hearing Impaired Children Below 18 Years–Old in Deaf Welfare Clinic of Molavi Rehabilitation Center

Naeimeh Daneshmandan, MD; Samaneh Hosseinzadeh, MSc; Robab Teymouri*, PhD
Pediatric Neurorehabilitation Research Center, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran

Objectives: Hearing impairment in children is considered as an important public health problem. Auditory function in these children is poor and depends on their hearing aids efficacy and also their ears' status. Hearing aids are very expensive and ear disease deteriorates its performance. Therefore detecting the ear disease and offering proper treatment is necessary. The aim of this study is to highlight the prevalence of ear disease in children with SNHL to justify the efforts made to insure diagnosis and adequate treatment.

Method: Eighty children with bilateral sensorineural hearing loss were selected in our study from deaf Welfare Clinic affiliated to Welfare Organization. Otological examination and tympanometry were performed for all these children.

Results: The most pathologic finding was ear wax and observed in 37 children (48.7%). Ear discharge was seen in 7 (8.7%) children. Normal TM in 63 (81.8%), abnormal TM in 14 (18.2%) and perforated TM in 3 cases were detected.

Conclusion: The most common disorder was wax which deteriorates hearing aids performance by clogged ear molds. Middle ear disease which aggravates the degree of hearing loss in one forth of children was observed. The high prevalence of external and middle ear disease highlights the need of regular otological examination in hearing impaired children.

Key words: Prevalence, Ear disease, Deafness, Children, Wax

Introduction

Hearing loss in early childhood can affect the development of speech and language, social and behavioral status, attention and academic achievement of children (1). External and middle ear diseases can affect auditory performance (2). Ear disease is common in a general population in any part of the world. External ear disease is the most common cause of visits in the district hospital of Ear, Nose and Throat departments (3). Acute otitis media in children is one of the most frequent reasons for concerned parents to take their child for medical services (4, 5). Many studies performed to determine the prevalence of ear disease in normal and hearing impaired children. Jacob *et al*. in an investigation showed that, most of children with hearing impairment had associated middle ear disease (6). A study in the first year school children showed that the most common disorder was wax and in consequence was middle ear disease. The prevalence of inactive ear disease in these children was the third common disorder (7). The other study in students of deaf school performed and ear examination findings showed that impacted wax was the most common pathology and the second prevalent disease was middle ear disease (8). Sensorineural Hearing Loss (SNHL) children are not sensitive to changes in their hearing threshold, so there is a need for regular otological examination in this group to detect and diagnose any extra or deteriorating conductive hearing loss (9). On the other hand, hearing aids are an important resource for the rehabilitation of hearing impaired children and additional conductive hearing loss may affect their hearing aids' efficacy (10, 11).

The aim of this study was to determine the prevalence of ear disease in hearing impaired children in order to enhance the role of regular otological examination in deaf rehabilitation centers.

*All correspondences to: E-mail: robab.teymouri@yahoo.com

Materials & Methods

A cross-sectional study was designed. The study population comprised of 80 SNHL children below 18 years-old from rehabilitation center (Molavi) affiliated to Social Welfare Organization in 2010-2011. All cases were examined by otolaryngologist to determine the ear disease among them. Tympanometry was performed to confirm our clinical evaluation of middle ear and tympanic membrane status. Tymponometry was not performed in perforated TM. In calculating the individual ear's hearing loss, we used the average of 500, 1000, and 2000 HZ SNHL in better ear. The deafness was classified as slight hearing loss if the threshold level was between 10-25 , and mild if it was between 25-50, moderate if it was between 51-70 , severe if it was between 71-90, and profound if it was between 91-110 dB.

Results

The range of age was 2-18 with mean 10 years. There were 49 boys (61%) and 31 girls (39%). In external ear examination, wax was present in 37 children (48.7%) of whom 27 children had bilateral wax. Ear discharge was seen in 7 children (8.7%). The most of children had Tympanogram type A (81.8%). Abnormal tympanogram was seen in 14 (18.2%) children. Among the 8 cases with type B, four cases had inactive chronic ear disease and four cases had middle ear effusion. In the last group, three cases respond to medical treatment and one case has been operated. Three children had perforated TM (table 1).

The most frequent degree of hearing loss was severe to profound (46.3%). Four cases had serious otitis media, of whom three cases responded to medical treatment, and in one myringotomy with grommet insertion was performed (table 2).

Table 1: distribution of tympanometry types in deaf children

Tympanometry type	No. of case (%)
normal (Type A)	63 (81.8)
Abnormal (Type B, C,…)	14 (18.2)

Table 2: distribution of degree of hearing loss in deaf children

Degree of hearing loss	No. of case (%)
Severe to profound hearing loss	37 (46.25)
Severe hearing loss	17 (21.25)
Moderate hearing loss	18 (22.5)
Mild hearing loss	4 (5)
Slight hearing loss	4 (5)

Discussion

Ear disease in general population is very common (12). On the other hand, external and middle ear disease can affect auditory performance. Auditory function in hearing impaired children is poor and dependent on their hearing aids' efficacy and their ears' status too. Ear disease can affect the hearing threshold but SNHL children are not sensitive to these changes. Many studies investigated this problem and showed the high prevalence of ear disease in hearing impaired children.

Our study showed that wax in SNHL children was a common disorder (49%) but its prevalence in other studies such as Swart (1995), Karatas and Egeli (2003) was 7%, 23% and 39% respectively (7, 8, 13). So, this comparison indicated that, wax problem was more frequent in deaf children in our studied group.

We also investigated the middle ear disease in SNHL children. Eighteen percent of them had abnormal TM that was less than abnormal TM in Egeli's report (22%) (7). It was compared with Kartasl and Oztruk studies, (8%) (10, 13) which showed lower frequency than ours. In our findings 3 children (3.7%) had perforated TM which it was compatible with the study of Kamal-Eldin *et al* that reported 25% middle ear problem and 5% perforated TM (14).

Roser in 2004 discussed about the aided speech threshold changes from 40 dB to 90 dB because of the clogged ear molds by ear wax (11). As we showed 49% of our NSHL children had wax which was a few more than other studies.

Most of investigated children (90%) in the present study had hearing loss with degree of moderate to profound. The degree of hearing loss in other studies showed that more than 90% were moderate to profound too (8-14). We indicated that prevalence of some of ear diseases in sensorineural hearing impaired children is high and regular otological examination is needed and tympanometry as a part of the screening protocol to diagnose middle ear disease is essential.

Acknowledgements

This study was supported by the Deputy of Research and Technology grant from University of Social Welfare and Rehabilitation Sciences.

I would like to thank Mrs. Malihe Sahami, the head manager of Molavi Rehabilitation Center, Mrs. Maryam Panahi, the head of Audiology Department and finally the hearing impaired children and their families for their good cooperation in this study.

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