

Original Article

Determination of Hearing Loss Prevalence in Preschool Children of Ahwaz

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Abstract

Introduction:

Children learn to communicate by hearing sounds. If there is hearing loss, the cognitive and speaking abilities and language learning will deteriorate. Early detection and intervention are important factors in the successful treatment of hearing loss in children. Hearing loss (HL) is divided into two main groups: conductive hearing loss (CHL) and sensorineural hearing loss (SNHL), the prevalence of the former being higher in children, many whose causes are easy to detect and treat.

Material and Methods:

In this descriptive, cross-sectional study, 785 children, aged 6-7 years, entering elementary school Grade 1 in the school year 2010/2011, were randomly selected from 10% of Ahwaz Hearing Loss Screening Centers, and their audiograms were studied. The collected data were analyzed using SPSS and descriptive statistics.

Results:

Out of the 785 preschool children examined in this study, 77 children (9.8%) suffered from HL (42.9% female and 57.1% male), 59.7% from CHL, and 40.3% from SNHL. Twenty-six percent suffered from bilateral HL and 74% from unilateral HL. Thirty-eight point ninety-six percent had abnormal tympanometry, 61% of whom were Type B. Most of the children (53%) had mild HL.

Thirty-one point two percent of parents were aware of their children's HL.

Conclusion:

Considering the high prevalence of HL, especially SNHL, in this study, which is usually permanent but detectable at the neonatal ages, raising public awareness and early screening of ear diseases, which can lead to the detection and treatment in most cases, seem to be vital.

Keywords:

Conductive Hearing Loss, Screening, Sensorineural Hearing Loss

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Introduction

Most children hear and listen from birth. They learn to talk by imitating the sounds around them and the voices of their parents and caregivers. But about 2 or 3 out of every 1,000 children (in the United States) are born deaf or hard-of-hearing. More lose their hearing later during childhood. (1-3).

The most important time for a child to be exposed to and learn language is in the first 3 years of life. Research suggests that those who have hearing impairment and get early intervention have better language skills than those who do not (1). The average age of the detection of congenital hearing loss is reported to be between 16 and 18 months (2). The detection of congenital hearing impairment in the first few months of life is of vital importance in rehabilitation and the earlier commencement of speech therapy. Fortunately, only a few cases of hearing loss cannot be helped with the help of modern technology, and the most effective treatment is early intervention (3).

The normal hearing level is between 10 and 25 dB. Hearing loss of 25-45 dB is considered mild, of 45-65 dB moderate, of 65-85 dB severe, and of over 85 dB profound (3). Children with mild to moderate hearing loss may not be detected until school age, when they are identified through either hearing loss screening or their lack of response to sounds in class. The results of research shows that effective rehabilitation measures to improve hearing has resulted in the improvement of children's cognitive ability, language learning, speech and behavior in the later years. Children who are detected earlier have better cognitive, social and language abilities, and besides receiving better treatment, can study in freer and less expensive environments.

Materials and Methods

This was a descriptive, cross-sectional study, and the study population consisted of preschool children who visited 10

screening centers in Ahwaz in accordance with the national project. One of these centers, the Fereshteh Center, was randomly selected in a draw, which 785 children visited over five weeks from June 24, 2010 to July, 30, 2010. These children were initially examined with mobile instruments at 500, 1000, 2000, and 4000 Hz, and any impairment at these frequencies was considered suspicious and the cases underwent audiometry. The results of the audiograms, tympanometry and other data were recorded in special questionnaires, and the collected data were analyzed using SPSS and statistic and descriptive methods. The chi-square test was used to examine the possible correlation between the categorized variables.

Results

This study was conducted on 785 preschool, 6-7-year-old children, consisting of 341 girls (43.4%) and 441 boys (56.6%). In the initial phase, 89 cases were suspected of hearing loss, 12 of whom were found normal in the later assessments, showing normal audiometry and tympanometry. Finally, 77 cases (9.8%) were found to have hearing loss, consisting of 33 girls (42.9% of the hearing loss group) and 44 boys (57.1% of the hearing loss group). The prevalence and the correlation of hearing loss and its being uni-/bilateral are shown in Table 1. According to tympanometric examinations, 47 cases (61%) had Type a tympanometry (Table 2).

The examination of birth weight in children with hearing loss showed that 51 children (66.2%) had had a weight of over 1500 gr, 10 children had unknown birth weights, and 16 children (20.7%) had had a weight of under 1500 gr, which showed no significant correlation between birth weight and different types of hearing loss ($P=0.47$).

The prevalence of hearing loss and its correlation with parents' awareness are shown in Table 3. Overall, 31.2% of parents were aware of their children's hearing loss.

Table 1: The prevalence and the correlation of hearing loss and its being uni-/bilateral in children with hearing loss

Type of hearing loss	Conductive	Sensorineural	Mixed	Total
Unilateral	31	26	0	57
Bilateral	15	5	0	20
Total	46	31	0	77
	59.7%	40.3%	0%	

Table 2: The prevalence of various types of tympanometry in hearing-impaired children

Type of tympanometry	Number	Percentage
Type An	47	61%
Type As	1	1.3%
Type C1	1	1.3%
Type C2	1	1.3%
Type B	27	35.1%

Table 3: The prevalence of hearing loss and its correlation with parents' awareness

Level of hearing loss	Mild Moderate Severe Profound							
	Number/Percentage	4 1	53.2%	25	32.5%	8	10.4%	3
Parents' awareness		19.5%		32%		62.5%		100%

Discussion

The prevalence of hearing loss was estimated at 9.8% according to this study; according to studies in Ardabil and Mahabad, the respective prevalence rates were 10.44% and 8.11% (4,5). In other counties, the prevalence of hearing loss in this age group is relatively similar to that found in our study (6-8).

In this study, 33 (42.9%) of the children with hearing loss were girls, and 44 (57.1%) were boys, yet despite the larger

number of boys, there was no significant correlation between hearing loss and sex. However, in a study conducted in Ilam, hearing loss was significantly more common in boys (9). In our study, 46 children (5.9% of the whole study population) had conductive hearing loss (CHL), and 31 (3.9% of the whole study population) had sensorineural hearing loss (SNHL). SNHL rates in the entire population are 0.6% in Zanjan, 1.86% in Ardabil, 4% in Berlin, Germany, and 1.7% in Nigeria (4,10,11,12).

Therefore, SNHL has a higher rate in this study than those found in others, which may be due to the small study population or lack of examination of younger children in this study. The higher prevalence of unilateral hearing loss (74%) in this study corresponds to that found in other studies (9,11,13). In our study, mild hearing loss had a higher prevalence (53.2%), which corresponds to the findings of other studies (6,9,13,16).

Conclusion

In view of the high prevalence of sensorineural hearing loss in this study compared with the findings of other studies, and in view of the permanence of SNHL and the higher prevalence of mild hearing loss, which leads to parents' lack of awareness, preventing therapeutic or rehabilitation measures, and hence causing disruptions in children's language learning, social skills, and school performance, and

also in view of various preventable and, more importantly, detectable hereditary and acquired causes in the developmental years

of children's life, early screening seems to be of vital importance.

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