

Incidence of Hearing Impairment among Rural and Urban School Going Children : A Survey

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Abstract. A total of 1,670 school going children (urban 1030 and rural 640) in the age range of 12-14 years were screened for hearing loss during a survey conducted by the Department of Otolaryngology of the Postgraduate Institute of Medical Education & Research, Chandigarh. 6.31% of cases in the urban group were found to be having hearing loss as compared to 32.81% of cases in the rural group. Secretory otitis media was found to be the commonest cause of hearing impairment in both the urban and rural group accounting for 5.33% and 33.59% respectively. (*Indian J Pediatr 1998; 65 : 141-145*)

Key words : *Hearing impairment; Secretory otitis media.*

Auditory disability is considered to have atleast two components in the first year of life. The first is the lack of ability to develop normal communicative skills. The second is the hindrance to the acquired ability to use these skills effectively. Unmanaged deafness has a major impact on a young child's normal progressive development. The early detection and management of hearing loss is essential so that many of the disabling and handicapping consequences of deafness can be alleviated and in some instances, avoided. Feinmesser *et al* (1982) found a prevalence of deafness in 1.7/1000 in children over 5 years of age¹.

A mild to moderate loss of hearing for an adult who has acquired both speech and language skills and the ability to use other skills to compensate for disabling environ-

ments is a less serious matter than the same degree of loss in a child who is in the process of acquiring these skills. Feagans (1986) found that the children with extremely persistent otitis end up with impaired communication skills².

There are many causative factors responsible for deafness in school going children. Kapoor (1965) in his study of infected and tropical diseases found conductive deafness in 14.58% of post typhoid cases, in 23.4% of cases following smallpox and 14.25% of cases following meningitis³. These diseases were also found to cause sensori-neural deafness. The other causative factors in deafness could be chronic ear discharge and other middle ear diseases^{4,5}.

Rach *et al* (1986) demonstrated by tympanometry that, 39% of 1,099 children examined had a middle ear effusion in atleast one ear and 21% of children had bilateral effusions⁵.

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The present study was undertaken to find out the incidence of hearing impairment among school going children and to compare the incidence among rural and urban children of same age group, so that steps can be taken for early detection and active management of the hearing impaired.

MATERIALS AND METHODS

The study was conducted at the Department of Otolaryngology of the Postgraduate Institute of Medical Education and Research, Chandigarh. A total of 1,670 school going children in the age range of 12-14 years constituted the subjects for the study. 1,030 children were from various schools of Chandigarh (urban group) and 640 children studying in the schools in the rural areas within the jurisdiction of the Union Territory of Chandigarh. Their sex distribution is shown in fig. 1. For the selection of schools, an initial survey was conducted and meetings were arranged with school

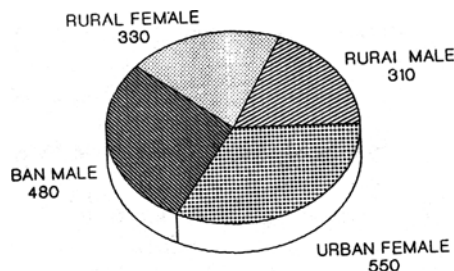


Fig. 1. Sex Distribution

principals and teachers to make them aware of the aim of the study. A detailed history, socio-economic status, status of personal hygiene and the nutritional status were recorded for all the children. Children having natal or postnatal complications, delayed developmental milestones, vertigo, trauma or other systemic disorders were excluded from the present study.

A detailed ear, nose and throat examination and general physical examination to detect anemia and general physique was conducted by ENT surgeons. All these children were screened for their hearing in a

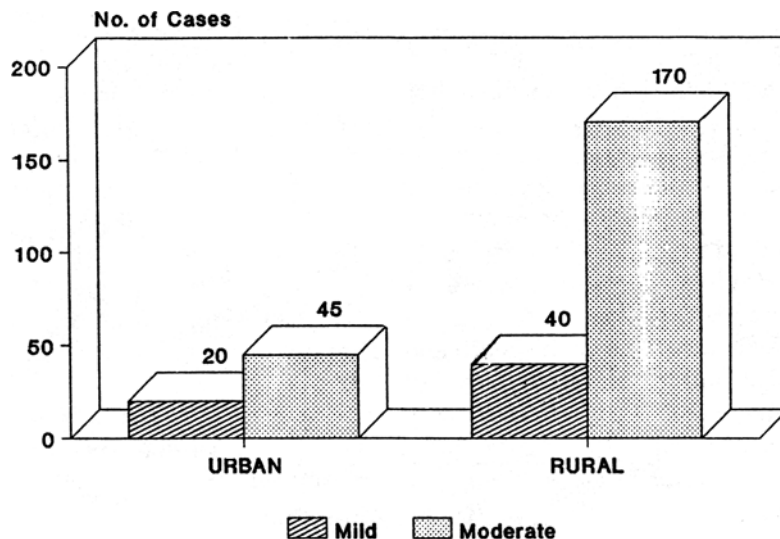


Fig. 2. Incidence of Deafness

TABLE 1. Associated Diseases

	Urban	Rural
Secretory otitis media	55 (5.33%)	100 (33.59%)
CSOM	5 (0.49%)	45 (7.03%)
Adenotonsillitis	50 (4.85%)	45 (7.03%)
Rhinitis/Sinusitis	110 (10.67%)	215 (19.53%)
Total	220	405

sound treated mobile van. The puretone audiometry screening involved presentation of a sound stimulus of 25 dB at each of the six frequencies i.e. 250Hz, 500Hz, 1KHz, 2KHz, 4KHz, and 8KHz. Any child who failed to respond at any of two frequencies on audiological screening was referred to the audiological section of Department of Otolaryngology, PGIMER, Chandigarh, where he was subjected to a detailed puretone and impedance audiometry. Children having hearing loss from 26-40 dB were labelled as having mild deafness and from 41-55 dB as having moderate deafness. Children with severe and profound hearing loss were not included in this study.

RESULTS

Out of the total of 1030 children in the urban group, 6.31% cases were found to be having varying degrees of deafness as compared to 32.81% cases in the rural group (N = 640).

In the urban group 20 children (1.94%) had a mild deafness and 40 children (4.36%) had moderate deafness whereas, in the rural group 45 cases (6.25%) and 170 children (26.56%) had mild and moderate degrees of hearing impairment respectively (Fig. 2).

The commonest cause of hearing impairment in this study was found to be secretory otitis media in both the urban and rural groups amounting to 5.33% and 33.59% respectively (table 1). CSOM was seen in 0.49% cases of urban population and 7.03% among rural population and chronic adenotonsillitis and rhinitis/sinusitis was seen in 4.85% and 10.67% respectively among urban children as compared to 7.08% and 19.33% among rural children. In all other children no abnormal ear, nose and throat findings were detected.

DISCUSSION

In the urban population 46.60% (480) were males and 53.40% (550) were females whereas there were 48.40% (310) males and 51.60% (330) females in the rural group. As no statistically significant difference was found between the children of rural & urban groups in terms of etiology of hearing impairment, they were clubbed together for the general statistical analysis of etiology.

The commonest cause of hearing impairment was found to be secretory otitis media, present in 5.33% cases among urban group and 33.59% among rural group. A similar finding was reported by Cauwenberge (1986) who found that 16% of appar-

ently healthy children (2.5-6 yrs.) had fluid in their ears⁶, whereas, others have found CSOM to be the commonest cause of conductive hearing impairment^{7,8}. In the present study CSOM was responsible for hearing impairment in only 0.49% cases of urban group and in 7.03% cases of the rural group. A significant number of cases who had presented with SOM had other associated problems like rhinitis, sinusitis or adenotonsillitis. This is in accordance with the observation made by Crown (1944) who found eustachian tube dysfunction in about 40% school going children having hearing impairment in the age group of 8-14 years⁹. Gibb (1979) also stated that there is a universal agreement that malfunction of the eustachian tube is the essential underlying cause¹⁰.

In the present study a significant number of cases (32.81%) among rural group had varying degrees of hearing impairment as compared to 6.31% in the urban group ($p < 0.05$). 26.50% cases of the rural group had moderate degree of hearing loss and 6.25% had mild hearing loss. As compared to this, 4.36% cases of urban group had moderate and 1.94% had a mild degree of hearing loss. Misra *et al* (1961) reported mild hearing loss in 31.6% and moderate hearing loss in 2.9% cases¹¹. Thus, a highly significant difference was seen in the incidence of hearing impairment among the urban and rural group, in the present study. Kodman and Sperrazzo (1959) found 5% of public school children having hearing loss¹². Scottish education department (1950) reported the incidence of hearing impairment to be 5-8% in school going children¹³.

The higher incidence of hearing impairment among the children of rural population may be attributed to the low socio-economic status.

The association of low socioeconomic status and illiteracy has already been reported¹⁰. The adverse factors seen in the rural group were malnutrition, vitamin A deficiency and exposure to recurrent infections. We further observed that illiteracy, poor health education and inadequate medical facilities are additional factors for such a high incidence of deafness.

CONCLUSION

During screening of 1670 school going children it was found that 6.31% of cases in the urban group had hearing loss as compared to 32.81% of cases in the rural group. Secretory otitis media was found to be the commonest cause of hearing impairment in both the urban and rural group accounting for 5.33% and 33.59% cases respectively. CSOM was found in 0.49% cases of urban group and 7.03% cases of rural group.

On prevalence/incidence grounds, the main target condition for screening must be otitis media with effusion. The six possible areas of behavioural sequelae of OME are : (1) psychophysiological maturation, (2) perception, (3) language and speech, (4) cognition and general intelligence, (5) educational attainment and (6) interpersonal behaviour. Primary prevention of OME is possible through the reduction of complex or risk factors associated with pathology. The medical/surgical intervention at the right time can prevent the hearing loss and thereby the resulting speech handicap to a large extent. Thus, we are of the opinion that such surveys should be conducted at regular intervals to detect the hearing loss in the preschool as well as school going population and a proper follow-up should be done for the cases found to be having middle ear/inner ear pathology and

speech and hearing impairment.

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