ORIGINAL ARTICLE

Determine the Frequency of Sensorineural Deafness in Children with Cerebral Palsy

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ABSTRACT

Aim: To determine the frequency of sensorineural deafness in child with cerebral palsy.
Study design: Descriptive/Cross-sectional
Place and duration: Pediatric Unit, Fauji Foundation Hospital, Lahore affiliated with Shalamar Medical & Dental College in collaboration with Audiology Department of The Children Hospital and Institute of Child Health from January, 2019 to January, 2020.
Methods: One hundred and forty cases were included. Children diagnosed as having cerebral palsy and fulfilling the inclusion criteria was included in the study. Hearing assessment was done with audiometry and degree of hearing loss was recorded in both ears in the form of mild, moderate, severe and profound degree of hearing loss.
Results: Most of the patients were between 1-5 years old (51%) followed by29% patients between 5-10 years with mean age of 5.1±3.5 years. Ninety one (65%) cases were males and 49 (35%) females. Forty two (30%) cases had microcephaly and 98(70%) cases had normal head circumference. Of 140 cases of cerebral palsy 37(26.4%) cases had hearing loss and 73.57% of patients of CP had no hearing deficit. Of 26.4% CP with hearing loss 11(29.7%) cases had mild, 10(27.02%) cases had moderate, 7(18.9%) had severe and 9(24.32%) cases had profound hearing loss.
Conclusion: It is concluded that the frequency of sensorineural deficit is high and significantly associated with cerebral palsy patients.
Keywords: Cerebral palsy, Sensorineural hearing loss, Degree of hearing loss

INTRODUCTION

Cerebral palsy (CP) describes a group of permanent, non-progressive disorder of the development of movement and posture, causing activity limitation, that are attributed to non-progressive disturbances that occurred in developing fetal or fetal brain[1]. Cerebral palsy is the most common cause of physical disability in children, identified with a prevalence ranging from 5 to 10 per thousand live births[2,3] Cerebral palsy may be associated with history of congenital abnormalities, prematurity, low birth weight or result from inflammatory, infectious and anoxic insult to the brain[4]. Brain insult thus may lead to spastic, extra pyramidal, atonic or mixed cerebral palsy.

Cerebral palsy child suffer from potential disabilities such as mental retardation, epilepsy, feeding difficulties, and ophthalmologic and hearing impairments[5]. Almost 15% of cerebral palsy children suffer from sensorineural deafness[3]. This hearing impairment early in life affects communication, cognition, behaviour, social and emotional development and, has been linked with lifelong deficits in speech and language acquisition, poor academic performance, personal-social maladjustments, and emotional difficulties[6]. Existence of hearing problems with unique motor problem in CP, present a range of special educational and psychological needs, to an even greater degree than for children with single disability[7]. Untreated reduced hearing acuity during infancy and early childhood compounded with additional disability may have more deleterious effect on communication abilities, speech and language, and cognitive development that can severely interfere with their psycho, difficulties in parent-child and peer-child interactions, low self-esteem, linguistic, auditory perceptual, and educational development[8,9]. Hearing assessment and screening is recommended, including behavioral audiometry, auditory-evoked brainstem responses (ABR), or transient evoked otoacoustic emissions. Hearing loss is demonstrated in units of decibels and graded into mild, moderate, severe and profoundly severe on audiometry[8].

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MATERIALS AND METHODS

This descriptive, cross-sectional study was conducted at Pediatric Unit, Fauji Foundation Hospital, Lahore, in collaboration with Audiology Department of Children Hospital from January, 2019 to January, 2020 and comprised 140 cases of cerebral palsy. All children with cerebral palsy as per operational definition and age between 1 to 15 years were included. Patients detailed demographic including age, sex and socio-economic status were recorded after taking informed consent from parents/guardians of patients. Patients with congenital malformations that would independently affect hearing

were excluded. Children with cerebral palsy were taken and sensorineural deafness determined through audiometry. The data was analyzed and using SPSS 20.

RESULTS

Majority of patients 83(59.29%) had ages <5 years, 41(29.29%) were ages 5 to 10 years and 16(11.43%) patients were ages above 10 years.65% cases were male (91) and 49(35%) were females. 42(30%) cases had microcephaly and 98(70%) cases had normal head circumference (Table 1). Among 140 cases of cerebral palsy 37(26.43%) cases had hearing loss and 103(73.57%) of patients of cerebral palsy had no hearing deficit (Fig. 1). Of 37 cerebral palsy, patients with hearing loss 11(29.73%) cases had mild, 10(27.03%) cases had moderate, 7(18.92%) had severe and 9(24.32%) cases had profound hearing loss. 22(60%) were male and 15(40%) patients were females. Seven cases of CP (18.92%) had unilateral hearing loss and 30(81.08%) cases had bilateral hearing loss (Table 2).

Table 1: Demographics of all the patients

Characteristics	No.	%
Gender		
Male	91	65.0
Female	49	35.0
Age (years)		
<5	83	59.28
5 – 10	41	29.29
>10	16	11.43
Cerebral Palsy Types		
Microcephalus	42	30.0
Normal Head	98	70.0

Fig. 1: Frequency of sensirineural hearing loss in cerebral palsy patients

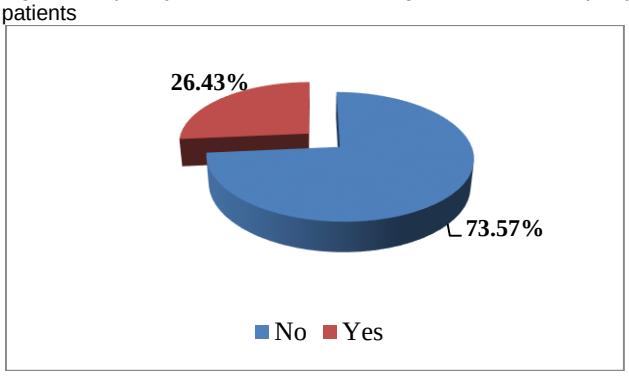

Table 2: Clinical presentation of hearing loss patients in cerebral palsy patients (n=37)

Variables	No.	%
Gender		
Male	22	60.0
Female	15	40.0
Degree		
Mild	11	29.73
Moderate	10	27.03
Severe	7	18.92
Profound	9	24.32
Site		
Unilateral	7	18.92
Bilateral	30	81.08

DISCUSSION

Cerebral palsy is the most common chronic motor disorder in children and is caused by damage to brain[10]. This damage can occur before, during or after birth. Cerebral palsy is often associated with other conditions that require treatment. These include intellectual disabilities, learning disabilities, seizures and problems with hearing and speech[11]. Many of studies demonstrated that hearing impairment is directly associated with cerebral palsy[12,13]. The present study was conducted to examine the frequency of sensorineural hearing impairment in children with cerebral palsy and in this regard 140 children were analyzed. In present study 91(65%) cases were male and 49(35%) were females and majority of patients 83(59.29%) had ages <5 years followed by 41(29.29%) were ages 5 to 10 years and 16(11.43%) patients were ages above 10 years. These results were similar to many of previous studies in which majority of patients were males 55% to 75% and the most common age group was 1 to 5 years[14,15]

In our study the frequency of sensorineural hearing loss in cerebral patients was 26.43%. Among hearing loss patients 11(29.73%) cases had mild, 10(27.03%) cases had moderate, 7(18.92%) had severe and 9(24.32%) cases had profound hearing loss. 22(60%) were male and 15(40%) patients were females. Seven cases of cerebral palsy (18.92%) had unilateral hearing loss and 81. 30(8%) cases had bilateral hearing loss. A study conducted by Ansari MS et al[16] reported that the frequency of sensorineural hearing loss in cerebral palsy patients was 18.8% among 117 patients. They reported mild, moderate, and severe degree of hearing impairment in 52%, 26%, and 22% of the children with cerebral palsy, respectively. Another study conducted by Ohal et al[17] regarding hearing loss in global developmental delay children and reported 36(29%) patients had speech delay and hearing loss.

Weir et al[18] reported the frequency of sensorineural hearing loss in cerebral palsy patients was 4% among 940 CP patients. Some other previous studies showed similarity to our study findings in which hearing impairment was highly associated with cerebral palsy[19,20].

CONCLUSION

The frequency of sensorineural deficit is high and significantly associated with cerebral palsy patients. Early diagnosis and better management can helps to reduce the morbidity associated with cerebral palsy.

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