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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 of Study: Department of Neurology, Chandka Medical College Hospital, Larkana from 1st October 2020 to 31st March 2021.

Methodology: One hundred and seventy patients of both genders age between 1-14 years were enrolled. Children diagnosed as having cerebral palsy and fulfilling the inclusion criteria was included. 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 90 (52.94%) were between 1-5 years old followed by 51(30%) patients between 5-10 years with mean age of 4.8±7.8 years. 115 (67.65%) cases were males and 55 (32.35%) females. 54 (31.8%) cases had microcephaly and116 (68.2) cases had normal head circumference. Among 170 cases of cerebral palsy 48 (28.23%) cases had hearing loss and 122 (71.77%) of patients of CP had no hearing deficit. Among 48 cases of CP with hearing loss 15 (31.25%) cases had mild, 14 (29.17) cases had moderate, 10 (20.83%) had severe and 11 (22.92%) cases had profound hearing loss.

Conclusion: The frequency of sensorineural deficit is high and significantly associated with cerebral palsy patients.

Keywords: Degree of hearing loss, Sensorineural hearing loss, Cerebral palsy

INTRODUCTION

In 1862, cerebral paralysis was first described by William James Little, an orthopedic surgeon.[1] Cerebral paralysis is caused by brain injury, usually before, during or shortly after birth. 'Brain' is a brain and the 'cerebral' is a movement or postural issue. Cerebral paralysis is a central nervous system (CNS) condition, which reflects non-progressive abnormalities or damage to the developing brain, movement, coordination, and posture.[2,3]

Brain paralysis is not progressive and cannot be transmitted. Even though education, treatment and applied technology can help persons with the CP enjoy productive lives, they are not curable. In peripheral and central nerve systems, children with CP suffer biological complications.[4] However, the treatment and rehabilitation procedures are conducive to hearing impairment when recognized early and effective action programs can be begun.

The survey carried out by Susan et al[5] demonstrates a 4% to 13% hearing loss in kids who suffer from cerebral paralysis, which is estimated to be as high as a third of the population. Therefore, it is possible to improve the future and success of the child by avoiding the difficulties of occurred hearing impairment. Melo et al[6] have researched audio rehabilitation for children with cerebral paralysis and said the indication of cochlear implantation in children with cerebral paralysis is still controversial at cochlear implants. Implant-friendly people hypothesize that the minimization of auditory sensory implantation in children can help enhance language, understanding and quality of life following cochlear implantation.

There are less data available for the degree and kind of hearing impairment of children with cerebral paralysis in poor countries like the Indian setting. The trial found that children with cerebral paralysis have hearing impairment. Our goal is to sensitize children with cerebral paralysis and prompt action to the probable corrective audiological disorders that hamper their development and their learning.[7]

MATERIALS AND METHODS

This descriptive, cross-sectional study was conducted at Department of Neurology, Chandka Medical College Hospital Larkana from 1st October 2020 to 31st March 2021 and comprised 170 cases of cerebral palsy. All children with cerebral palsy and age between 1 to 14 years were included. Patients detailed demographic including age, sex and socioeconomic 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. Complete data was analyzed by SPSS22.

RESULTS

Most of the patients 90 (52.9%) were between 1-5 years old followed by 51(30%) patients between 5-10 years with mean age of 4.8±7.8 years. Majority 115 (67.6%) cases were males and 55 (32.4%) females. 116 (68.2) cases had normal head circumference and 54 (31.8%) cases had

microcephaly (Table 1). Among 170 cases of cerebral palsy, hearing loss found in 48 (28.3%) cases and 122 (71.7%) of patients of CP had no hearing deficit (Table 2).

Among 48 cases of CP with hearing loss, 15 (31.2%) cases had mild, 14 (29.2) cases had moderate, 10 (20.8%) had severe and 11 (22.8%) cases had profound hearing loss. Bilateral site was found in 40 (83.34%) cases and unilateral in 8 (16.6%) cases (Table 3).

Table 1: Demographics of enrolled cases (n=170)

Variable	No.	%
Gender		
Male	115	67.6
Female	55	32.4
Age (years)		
<5	90	52.8
5 – 10	51	30.0
>10	29	17.2
Cerebral Palsy Types		
Normal Head	116	68.2
Microcephalus	54	31.8

Table 2: Prevalence of hearing loss among CP (n=170)

Hearing Loss	No.	%
Yes	48	28.3
No	122	71.7

Table 3: Clinical presentation of hearing loss patients in cerebral palsy patients (n=37)

Variable	No.	%
Degree		
Mild	15	31.2
Moderate	14	29.2
Severe	10	20.8
Profound	11	22.8
Site		
Bilateral	40	83.3
Unilateral	8	16.7

DISCUSSION

Cerebral paralysis is a persistent movement condition of the most frequently reported in children and is caused by brain injury.[8] This can happen before, during or after birth. Other disorders requiring treatment are frequently connected with brain paralysis. Intellectual impairments, learning challenges, seizures and hearing and speech problems.[9] Numerous investigations have shown the direct connection of hearing impairment to cerebral paralysis.[10,11] The present study examined the frequency of sensory impairment in children with cerebral paralysis and 170 children were presented in this regard. In the present study, most of the patients 90 (52.9%) were between 1-5 years old followed by 51 (30%) patients between 5-10 years with mean age of 4.8±7.8 years. Majority 115 (67.6%) cases were males and 55 (32.4%) females. These results were similar to many earlier research in which most of the patients were males 55% and 75% and the most prevalent age group was between 1 and 5 years.[12,13] We found that 116 (68.2) cases had normal head circumference and 54 (31.8%) cases had microcephaly.

In this study, hearing loss found in 48 (28.2%) cases and 122 (71.8%) of patients of CP had no hearing deficit. Among 48 cases of CP with hearing loss, 15 (31.2%) cases had mild, 14 (29.2) cases had moderate, 10 (20.8%) had severe and 11 (22.8%) cases had profound hearing loss. Bilateral site was found in 40 (83.4%) cases and unilateral hearing loss in 8 (16.6%) cases. A study by Ansari et al[13] has found that 18.8% of 117 individuals had a sensorineural hearing loss in cerebral paralysis patients. In another study carried out by Ohal et al[14], 36 (29%) patients experienced hearing loss for children with worldwide developing countries. For the 940 individuals with cerebral palsy, Weir et al[15] observed 4% cerebral palsy of sensorineural hearing loss. Some prior research have shown consistency with our findings of a study with a strong association between hearing impairment and brain paralysis.[16,17]

Moralis and colleagues[18] evaluated 64 cerebral paralysis children and found 60% sensory hearing loss. Zafeiriour et al[19] examined hearing in brainstem children and discovered that 22 percent had an aberrant finding of brain stem that evokes audiometry in spastic brain paralysis.

Our data differ with Morales et al[18] which stated a 60% hearing impairment prevalence among CPs, however the same results were provided by Odding and Hendrik[20] 25% hearing impairment as our data. The variances in the frequency of hearing loss in CP in these studies may be attributed to differences in each research of CP types and/or in these situations varied causes of CP.

The biggest numbers of CP children with sensorineural hearing impairments were followed by leading and mixed hearing impairment, which could lead to brain damage and associated difficulties such as poor body growth, oral-sound hygiene and frequent cold and cough. There were faulty speech and language skills in all children with hearing impairment.

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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