Original Article

Incidence of Sensor Neural Deafness in Children with Cerebral Palsy

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ABSTRACT

Objective: To study the Incidence of Sensor Neural Deafness in Children with Cerebral palsy.
Study Design: Observational and Experimental Study
Place and Duration of Study: This study was conducted at the Idris Teaching Hospital Sialkot Medical College Feb 2018 to Jan 2020.
Materials and Methods: One hundred and seventeen patients of sensor neural deafness of cerebral palsy were included in this observational and experimental study. History, examination and demographic data was recorded in the design Performa. Informed Written consent was taken Priorly in every case. The permission of ethical committee of the institute was also considered. The results were analyzed on SPSS version 20.
Results: The incidence of Cerebral palsy was maximum 34(29.05%) Quadriplegia patients and minimum 13 (11.11%) Hemiplegia.
The incidence of Audiometry Behavioral threshold was maximum in Athetoid 9(36.00%) in mild behavioral threshold and minimum in Athetoid 2(8.00%) and atonic threshold 2(10.50%). In Hearing screening there was incidence maximum refer patients 40(54.79%) and minimum in atonic 7(17.50%). The type of hearing was maximum in type B 8(42.10%) in spastic patients and minimum in type B Atonic 3(23.07%). ABR in incidence was maximum 10(41.66%) in moderate spastic and Athetoid patients and minimum in severe atonic patients 2(33.33%).
The incidence of hearing impairment was maximum in spastic cerebral palsy 9(37%) in conductive patients and minimum in hypotonic cerebral palsy 6(25%).
The incidence of cerebral palsy was maximum 35(62.50%) in male in age group 11-15 years and minimum 21(37.50%) in age group 5-10 years. The incidence of cerebral palsy in female was maximum 39(63.93%) in age group 11-15 years and minimum 22(36.06%) at age group 5-10 years.
Conclusion: Cerebral palsy (CP) is often accompanied by other disorders of cerebral function. Auditory disorders are very frequent in this population. The identification of hearing impairment also important as disorders of hearing is changeable and manageable with wide range of medical, to restore to good health devices, and treatment techniques. Therefore, the identification of hearing impairment in children with CP may suggest appropriate line of management and can provide important prognostic information.
Key Words: Sensor neural, Deafness, cerebral Palsy, Children

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INTRODUCTION

Kids with CP have a natural inconvenience in the fringe and focal sensory systems. [1],[2],[3] Therefore, CP is regularly joined by different clutters and issues of cerebral capacity, specifically discourse and language hindrance, scholarly disability, issue of vision and hearing, consideration, carefulness, and conduct. [4] [5]

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Consequently most of the influenced people can't take an interest and discover their place in ordinary society. [6] [7] [8]

Advances in treatment of perinatal contaminations and improved clinical offices for neonatal consideration have brought about additionally enduring babies, however with entanglements that may incorporate hearing weakness. Specifically, decreased death paces of untimely children with low birth weight are liable for additional babies with complexities might be of hearing debilitation. [6] Recent examinations have indicated that conference hindrance happens in 4-25% of youngsters with cerebral paralysis. [6] Hearing hindrance is generally normal in kids with exceptionally low birth weight or serious hypoxic-ischemic put-down. [7] [11] [12]

Presence of hearing issues with extraordinary engine issue in CP, present a scope of exceptional instructive and mental needs, to a much more prominent degree than for youngsters with single incapacity. [11],[12],[13]

Untreated decreased hearing sharpness during early stages and youth intensified with extra incapacity may have progressively harmful impact on correspondence capacities, discourse and language, and intellectual improvement that can seriously meddle with their psycho, challenges in parent-kid and companion youngster collaborations, low confidence, phonetic, sound-related perceptual, and instructive turn of events. [7] [11] [12]

Be that as it may, the impacts of hearing disability are manageable to the mechanical treatment and restoration systems whenever recognized at an early age and powerful mediation program is initiated. [11-13] Thus, by and large future and accomplishment of a kid can be improved and decreasing the complexities of concealed hearing impedance. [14] [15] [16]

Be that as it may, there is no information with respect to commonness, degree, and sort of hearing debilitation in CP is accessible in the Indian setting. Thus, we propose to consider the nearness of hearing hindrance in kids with CP. Our point is to build the consciousness of conceivable correctable audio logical weakness that thwart improvement and learning in kids with CP.

MATERIALS AND METHODS

One hundred and seventeen patients of sensoneural deafness of cerebal palsy were included in this observational and experimental study. History, examination and demographic data was recorded in the design Performa. Informed Written consent was priorly in every case. The permission of ethical committee of the institute was also considered. The results were analyzed on SPSS version 10.

RESULTS

The incidence of Cerebral palsy was maximum 34(29.05%) Quadriplegia patients and minimum 13(11.11%) Hemiplegia as shown in table no1.

Table No.1: Distribution of types and subtypes and severity of children with cerebral palsy

Cerebral types	N (%)	Mild	Moderate	Severe
Spastic				
Quadriplegia	34(29.05%)	7(20.58%)	12(35.29%)	10(29.41%)
Diplegia	26(22.22%)	- (00.00%)	13(50%)	11(42.30%)
Hemiplegia	13(11.11%)	4(30.76%)	9(69.23%)	7(53.84%)
Athetoid	25 (21.36%)	-(00.00%)	10(40%)	11(44%)
Hypotonic	19 (16.23%)	5(26.31%)	9(47.36%)	9(47.36%)
Total	117(100%)	16(13.67%)	53(45.29%)	48(41.02%)

The incidence of Audiometry Behavioral threshold was maximum in Athetoid 9(36.00%) in mild behavioral threshold and minimum in Athetoid 2(8.00%) and atonic threshold 2(10.50%). In Hearing screening there was incidence maximum refer patients 40(54.79%) and minimum in atonic 7(17.50%). The type of herening was maximum in type B 8(42.10%) in spastic patients and minimum in type B Atonic 3(23.07%). ABR in incidence was maximum 10(41.66%) in moderate spastic and Athetoid patients and minimum in severe atonic patients 2(33.33%) as shown in table no2.

Table No.2: Distribution of types and subtypes and severity of children with cerebral palsy

	Spastic	**Athetoid**	**Atonic**
Number	73(62.39%)	25(21.36%)	19(16.23%)
Audiometry: Behavioral threshold			
Mild	4(5.47%)	9(36.00%)	-(00.00%)
Moderate	3(4.10%)	3(12.00%)	2(10.52%)
Severe	-(00.00%)	2(8.00%)	2(10.52%)
TEOAE: Hearing screeing			
Refer	40(54.79%)	15(37.5%)	7(17.50%)
Pass	33(45.21%)	10(30.30%)	12(36.36%)
Tympanogram: Type of hearing impairment			
Type : A	7(36.84%)	5(33.33%)	6(46.15%)
Type: B	8(42.10%)	6(40.00%)	3(23.07%)
Type: C	4(21.05%)	4(26.66%)	4(30.76%)
ABR (click): Threshold estimation			
Mild	9(37.50%)	-(00.00%)	-(00.00%)
Moderate	10(41.66%)	10(62.50%)	4(66.66%)
Severe	5(20.83%)	6(37.50%)	2(33.33%)

PTA: Pure tone audiometry, OAE: Otoacoustic emission, ABR: Auditory brainstem response, TEOAE: Transient evoked otoacoustic emission

The incidence of hearing inpairement was maximum in spastic cerebral palsy 9(37%) in conductive patients and minimum in hypotonic cerebral palsy 6(25%) as shown in table no3.

Table No.3: Types of hearing impairment

Cerebral palsy	Children	Conductive n (%)	Sensorineural n (%)	Mixed n (%)
Spastic	24	9(37%)	9(37%)	6(25%)
Quadriplegic	12	7(58%)	3(25%)	2(17%)
Diplegic	07	3(42%)	2(29%)	2(29%)
Hemiplegic	06	4(66%)	-	2(34%)
Athetoid	16	-	13(81%)	3(19%)
Hypotonic	06	5(83%)	-	1(17%)
Total	46	14(31%)	22(48%)	19(41%)

Table No.4: Age and gender distribution in cerebral palsy patients

Sr. No	**Age(years)**	**Male**	**Female**
1	5-10	21(37.50%)	22(36.06%)
2	11-15	35(62.50%)	39(63.93%)
Total		56(100%)	61(100%)

The incidence of cerebral palsy was maximum 35(62.50%) in male in age group 11-15 years and minimum 21(37.50%) in age group 5-10 years. The incidence of cerebral palsy in female was maximum

39(63.93%) in age group 11-15 years and minimum 22(36.06%) at age group 5-10 years as shown in table 4.

DISCUSSION

Cerebral palsy (CP) comprises of a heterogeneous gathering of non-progressive clinical conditions that are described by engine and postural brokenness because of the harm to creating cerebrum. An associative inability, for example, hearing weakness frequently exits with cerebral palsy (CP). The conjunction of unidentified hearing debilitation can influence the treatment plan and long haul result of CP. In this manner, a comprehension of the communication of the engine segments and connected shortages in kids with CP is fundamental for defining far reaching and reasonable objectives and better results. [2],[6],[7]

We contemplated 117 instances of CP to analyze the sorts and level of hearing impedance in CP. The examination discovered 46 (39%) out of 117 youngsters with hearing debilitation alongside CP. The aftereffects of unadulterated tone audiometry, tympanometry, otoacoustic outflow, and sound-related cerebrum stem reactions have recorded hearing hindrance in 46 (39%) out of 117 subjects.

Our information varies from Morales et al. who expressed predominance of 60% hearing hindrance among CP, though odding and Roebroech Hendrik announced 25% rate of hearing disability in cerebral-palsied populace. The distinctions in recurrence of hearing weakness in CP in these investigations may because of the varieties in kinds of CP for each situation study or potentially the variable reasons for CP in these cases.

The most elevated number of kids with CP found to have sensorineural hearing disability followed by conductive and blended sort of hearing hindrance that can be represented harm to the developing mind and aggravated with the related issues, for example, poor body development, oral-aural cleanliness, and continuous cold and hack. All youngsters who have hearing weakness displayed imperfect discourse and language aptitudes. Inadequate discourse has been seen in 63% of contemplated populace.

CONCLUSION

Cerebral palsy (CP) is often accompanied by other disorders of cerebral function. Auditory disorders are very frequent in this population. The identification of hearing impairment also important as disorders of hearing is changeable and manageable with wide range of medical, to restore to good health devices, and treatment techniques. Therefore, the identification of hearing impairment in children with CP may suggest appropriate line of management and can provide important prognostic information.

Author's Contribution:

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Revisiting Critically:	Muhammad Arif, Abid Hussain
Final Approval of version:	Muhammad Arif

Conflict of Interest: The study has no conflict of interest to declare by any author.

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