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Original Article

Effect of Speech Therapy in Children with Cochlear Implant

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ABSTRACT

Hearing loss is the absence or difficulty in hearing. And its levels range from mild severe to profound while the term deafness is used for the person who cannot hear it. **Objective:** To determine the effect of speech therapy in children with cochlear implant. **Methods:** This descriptive study was carried out at Fatima Memorial College Medicine and Dentistry, from 1st October 2021 to December 2021 to determine the effect of speech therapy in children with cochlear implant. For this purpose a total of 30 children who were implanted and receiving speech therapy were evaluated. Effect of speech therapy was determined by collecting data from the parents of cochlear implant children by using a questionnaire. The questionnaire constituted the receptive and expressive language measures that determine the effect of speech therapy. Questionnaire which was used as data collecting instrument that was designed by expert opinion and literature review. **Results:** Result indicated that out of 30 children who were implanted and receiving speech therapy, 30 (100%) were communicating verbally using word phrase and sentence. These findings suggested that children with cochlear implant were communicating verbally instead of sign language or gestural mode of communication and improved intelligibility. **Conclusions:** It is concluded that speech therapy is effective in children with cochlear implant.

INTRODUCTION

In the 1980s, World Health Organization recommended the term 'deaf' which can be used for individuals who have lost their ability to hear and are so severely impacted that they need hearing aids to amplify the sounds which might come in their reception [1]. WHO in the 1980s recommended the following classifications on the basis of pure tone audiometry taken from a number of frequencies 500,1000, 2000 [2]. Mild range is from 26 to 40. While the moderate ranges from 41 to 55 severe moderately severe ranges from 56 to 70. Severe is from 71 to 91 and profound is more than 91. Children with profound ever hearing loss that is greater than 90 decibels loss or total deafness failed to develop speech and communicative skills and are termed as deaf, mute or dumb. The children have no defect in their speech production apparatus, but are unable to hear the sound and hence imitated. The main effect is deafness. They never heard a speech sound and therefore cannot develop it [3]. So to develop speech and language communication, a child must be able to fully participate and engage with the wider society in order to develop expressive and receptive skills. Reception of information through visual auditory and sang tactile. That is the sense organs will be expressed in the

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form of oral written and sign language by which the child will be able to express his or her opinions and ideas [4]. But when the child is completely deaf or the Cochlear and hearing apparatus is completely dysfunctional, then the child may require a cochlear implant to develop speech skills and by the means of Speech and Language Pathology they can be made to understand and interpret sounds [5]. There are many therapies available to address the key learning and communication of for children with hearing impairment with the advancement of cochlear implant large number of patients who have the means to undertake the procedure and have the environment to support their children are opting for this procedure and has become the mainstream intervention for people who are deaf [6]. Verbal therapy is a type of therapy which is used after the child is implanted with the artificial cochlea and would help the child develop his speech and language abilities or do verbal therapy can also be used in other degrees of hearing impairment. That is the mild and moderate with the use of hearing aids this therapy is equally as effective [7]. Trained and certified or do you verbal therapists provide sessions, therapies, train the parents and manage educational services for the children with hearing impairment or cochlear implant. The ultimate goal of this therapy is to develop a sense of listening, which can later help in the child's development as well as language use [8]. If the ability to respond to the presence or absence of sound is the first step and then the child moves on to pay attention to that particular sound and imitate it in a manner which would be able to communicate with the wider audience when the child learns different sounds and is able to imitate them, the ability of repeating becomes markedly increase in the hearing stimulus or speech stimulus [9].The ability to understand the meaning of this speech and by answering questions and following instructions or participating in a conversation. The child's response must be quantitatively different than stimuli presented. The effectiveness of the speech therapy of these patients depends on their age, their hearing history, their age of cochlear implant, the mode of communication learning style and the literacy rate. There are several therapies approaches available which are similar to audio verbal therapy, or total communication or Cued Speech. Each of these approaches differ in the amount of structured therapy, which the child will require as a consequence [10].

METHODS

This descriptive cross-sectional study was carried out at FMH College of Medicine and Dentistry, from 1st October 2021 to December 2021 to determine the effect of speech therapy in children with cochlear implant. For this purpose a total of 30 children who were implanted and receiving speech therapy were evaluated. Effect of speech therapy was determined by collecting data from the parents of cochlear implant children by using a self-designed questionnaire. The questionnaire constituted the receptive and expressive language measures that determine the effect of speech therapy. Questionnaire which was used as data collecting instrument that was designed by expert opinion and literature review.

RESULTS

Out of 30 subjects, 17(56.7%) were males and 13(43.3%) were females and the mean age of patients was 14.30± 7.53 years as shown in Table 1.

Demographics		N=Frequency	%Frequency
Gender	Male	17	56.7%)
	Female	13	43.3%
Age of Patients	Minimum	Maximum	Mean
	7	42	14.30 ± 7.53

Table 1: Participants Characteristics

On asking the respondents about hearing loss of their children, 26(86.7%)responded that the hearing loss of their child was congenital and 4(13.3%) responded that the hearing loss of their child was acquired. On asking the respondent about diagnosis of hearing loss of their children, 27 (90%) responded that their child was diagnosed at the age of 1 to 12 months, and 3(10%) responded that their child was diagnosed after the age after 36 months. On asking the respondent about the start of speech therapy sessions, 19(63.3%)responded that their speech therapy was started 2 month after cochlear implantation, 9(30%) responded that their speech therapy was started 3 month after cochlear implantation, 1(3.3%) responded that their speech therapy was started 4 months after cochlear implantation, 1(3.3%) responded that their speech therapy was started 6 month after cochlear implantation. On asking the respondent about the number of their speech therapy sessions after cochlear implantation, 3(10%)responded that they had only 1 speech therapy session per month,6(20%)responded that they had only 4 speech therapy session per month, 211(69.9%) responded that they had more than 4 per months speech therapy sessions. On asking the respondent about the communication of their children after cochlear implantation, 30(100%) responded that their child communicate verbally after cochlear implantation, none of them reported the sign language or gestural mode of communication of their child as shown in Table 2 below.

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Questions	Response	Frequency(%)
Is hearing loss of child Congen or Acquired?	Yes	26 (86.7)
	No	4(13.3)
Is hearing loss of patients Unilateral or Bilateral?	Yes	30(100.0)
	No	0
When the HL was first diagnosed?	1-12	20 (66.6)
	13-24	2 (6.6)
	25- 36	5 (16.6)
	after 36	3(10.0)
Whatwas age at the time of cochlear implant?	1-12	2(6.7)
	13-24	2(6.7)
	25- 36	6(20.0)
	after 36	20(66.6)
Whenwas speech therapy started after CI?	After 1 month	0
	After 2 months	19(63.3)
	After 3 months	9(30)
	After 4 months	1(3.3)
	After 5 months	0
	After 6 months	1(3.3)
No. of speech therapy session after CI?	1 per month	3(10)
	2 per month	0
	3 per month	0
	4 per month	6(20)
	More than 4 per month	21(69.9)
How does your child communicate after cochlear implantation?	Verbal communication	30(100)
	Non Verbal communication	

Table 2: Question-wise Analysis

DISCUSSION

The results indicated directly that the verbal communication of children with cochlear implant was 100% by using word, phrase and sentence [10]. The findings suggested that the speech therapy was effective in children with cochlear implant but some discrepancies were also observed regarding the implantation of the children and speech therapy sessions [11]. On asking the respondent when they came to know about the deafness of their child. 27(90%) responded that the identification was done when the child was less than 12 months, 3 (10%) said that they identify the impairment in their child after age of 36 months [12]. As the findings suggest, the majority of respondents identified deafness in their child when he/she was less than 12 months of age. It shows that symptoms of deafness were found quite evident. The result also suggested more concern of the parents towards their children. It is important to note that majority of parents were found more concerned towards the verbal communication of their children as they implanted their child to restore the auditory skills [13,14]. The result suggested that 2 (6.7%) children were implanted at the age of 1 to 12 months, 2 (6.7%) children were implanted at the age of 13 to 24 months, 6(20.0%) children were implanted at the age of 25 to 36 months, and 20 (66.7%) children were implanted after 36 months of their age. It is important to note that early implantation is more important to develop verbal communication but these findings suggested that 20 (66.7%) children were implanted after the age of 36 months of diagnosis [15,16]. Financial situation can be possible reasons for this delay in cochlear implantation. On asking about the start of speech therapy sessions from the parents of cochlear implant children 19(63.3%) responded that speech therapy was started 2 month after cochlear implantation, 9(30%) responded 3 month, 1(3.3%) responded 4 months and 1(3.3%) responded that their speech therapy was started 6 month after cochlear implantation. These findings suggested that mostly parents provided speech therapy to their children within 3 months of cochlear implantation which shows their concerns about the verbal communication. It is important to note that intensive speech therapy is more important to develop verbal communication but the result indicated that children received fewer speech therapy sessions as only 21(69.9%) responded that they had more than 4 per months speech therapy sessions, 3 (10%) responded that they had only 1, 6 (20%) responded that they had only 4 speech therapy session per month. There can be many possible reasons for lack of intensive speech therapy sessions, financial situation, availability of speech therapist and cultural atmosphere may be few of them [17,18]. Despite delay in the implantation of children with cochlear implant the expressive and receptive language skills in children with cochlear implant were excellent [19]. Almost 30 (100%) responded that their child is able to understand words, phrase, and sentence and communicate verbally by using words, phrase and sentence after cochlear implantation and 30 (100%) responded that their child's speech is intelligible because speech therapy was started immediately after cochlear implantation and greater no. of speech therapy sessions per month [19,20].

CONCLUSION

It is concluded from this study that speech therapy is effective in children with cochlear implant.

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