

Effects of Cochlear Implants on the Quality of Life of Children

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ABSTRACT

Objective: The purpose of this study is to determine the effectiveness of cochlear implants also examining the factors influencing the quality of life of children after CI.

Study Design: Cross-sectional

Place and Duration: PHFMC(BHU 189, Toba Tek Singh). Jan 2020-Oct 2020

Methods: Forty five children of aged between 3-10 years were presented in this study. Patients had cochlear implantation were included. Informed written consent was taken from the parents of children for demographically details in which age, sex, parent's education status, residency and employment. Paediatric Quality of Life Inventory 4.0 - Generic core scale (PedsQL™ 4.0 - GCS) was used. Children were assessed in terms of communication, self-reliance, socio economic behavior, education, family understanding and effects of implantation. SPSS 23.0 version was used to analyze data.

Results: Among 45 cases, majority of the patients 27 (60%) were males and 18 (40%) were females. 6.07±3.32 years were the mean age of the children. 24 (53.3%) cases were from urban areas and 19 (46.7%) patients had rural residency. Majority of the mothers 29 (64.4%) were housewives and 21 (46.7%) mothers were literate. Mean age at the time of surgery was 4.12±3.63 years. Mean time of cochlear implantation 4.01±1.21 years. We found that the improvement in communication with the known people was 23 (51.1%) and before cochlear implantation effectiveness of hearing aids were slightly low 11 (24.4%). We found that the improvement of social relationships, family well-being, within-family relationships, educational conditions, and self-reliance were all observed to be satisfactory.

Conclusion: In this research we concluded that the cochlear implantation was significantly helpful for children in hearing, language understanding, self-reliance, educational conditions. An understanding of the child's and family's unique needs will aid in the development of personalized speech therapy, which can help enhance outcomes for rehabilitation.

Keywords: Children, Cochlear Implant, Quality of life

INTRODUCTION

For patients, their loved ones, and society, hearing loss can have a profound effect. Hearing loss is the most common form of sensory impairment, with an estimated 466 million people suffering from it globally, according to the World Health Organization (WHO). A surge in the number of people with debilitating hearing loss has also been expected. Some 34 million children worldwide are affected by hearing loss, and 0.9 percent (1.4 million) of them live in the Middle East and North Africa [1]. 2574 Saudi preschoolers aged 4 to 8 years old were surveyed in Riyadh for the study. The prevalence of hearing loss was estimated to be 1.75 percent, of which 15.6% had sensorineural hearing loss [2]. This can have a substantial impact on the children's social and academic performance, as well as their speech and language development [3]. A child's social and cognitive development, as well as their ability to communicate effectively in a foreign language, both benefit greatly from early exposure to that language [4]. All of these factors can influence the degree of household stress, as mentioned by Quittner et al. [5], which is why intervention is necessary for children with hearing impairment who have delayed language development. Children with substantial hearing loss can benefit from the use of cochlear implants (CI), according to a number of studies. More than one study looked at a wide range of outcomes—from speech perception to hearing to receptive vocabulary to expressive vocabulary to social and academic functioning to quality of life (QoL) [6].

One of the results of cochlear implants is quality of life (QoL). For example, it is defined as an individual's assessment of their current status in life in relation to their goals; standards; and worries based on the context in which they live. QoL is defined by a person's personal characteristics, physical health, mental health, social health, and functional health [7,8]. QoL can be described and analysed by adults and children alike, but it can also be quantified using a proxy for children with disabilities [9,10]. A relevant and effective measure for measuring quality of life in children's health, the Paediatric Quality of Life Inventory (PedsQL™ 4.0 - GCS) can be used with children in good health as well as those with a variety of health concerns.

Thus, children with hearing loss have been able to explain the development patterns of children in connection to the many processes related with language and literacy acquisition (such as fluency in speech perception, vocabulary, and reading comprehension) in typically developing children [11]. According to Dunn and Munn, 2 to 3 neonates out of every 1000 in the United States are born with hearing loss (2008). [12,13] It is a multi-dimensional paradigm, according to WHO (1998), that includes subjective judgments of one's contentment or enjoyment with life and day-to-day tasks. [14]

Parents of children with cochlear implants will benefit from this study since it will increase knowledge and educate speech and language therapists on how to improve the quality of life for these families. Concerned for the well-being of youngsters who have cochlear implants, investigators would be interested in the organization. Parents of children with cochlear implants can benefit from this knowledge, as can speech and language therapists, who can utilize it to provide the best possible care for their children.

MATERIAL AND METHODS

This cross-sectional study was conducted at PHFMC(BHU 189, Toba Tek Singh) and comprised of 45 cases had cochlear implants. Informed written consent was taken from the parents of children for demographically details in which age, sex, parent's education status, residency and employment. Auditory Neuropathy Spectrum Disorder (ANSD), those with auditory nerve hypoplasia, those with outer or middle or inner ear deformity and those who did not understand the directions of the procedures proposed in the research were excluded from this study.

Children were aged between 3-10 years. The questionnaire (CCIPP) was used to measure Quality of Life (QOL), a specific instrument for the paediatric population that uses CI. The CCIPP consists of 42 generic questions organised into seven primary QOL domains: Good communication depends on many different aspects, such as good interpersonal relationships and good familial ties; good general functioning; good self-reliance; good implantation effects; and good educational outcomes. Parents were asked to rate their agreement with the claims using a Likert scale, with responses ranging from strongly agree to agree, agree

to neither agree nor disagree, disagree to strongly disagree, strongly disagree to strongly disagree. Higher scores on the scales and subscales imply a higher overall level of satisfaction with one's life. Paediatric Quality of Life Inventory 4.0 - Generic core scale (PedsQL™ 4.0 - GCS) was used. Mean standard deviation was used. SPSS 23.0 version was used to analyze data. Categorical variables were assessed by frequencies and percentages.

RESULTS

Among 45 cases, majority of the patients 27 (60%) were males and 18 (40%) were females. 6.07±3.32 years were the mean age of the children. 24 (53.3%) cases were from urban areas and 19 (46.7%) patients had rural residency. Majority of the mothers 29 (64.4%) were housewives and 21 (46.7%) mothers were literate.(table 1)

Table 1: Baseline characteristics of enrolled cases

Variables	Frequency	Percentage
Mean age (years)	6.07±3.32	
Gender		
Male	27	60
Female	18	40
Residency		
Urban	24	53.3
Rural	19	46.7
Employment Status of Mothers		
Job holders	16	35.6
Housewives	29	64.4
Literacy		
Yes	21	46.7
No	24	53.3

In current study mean age at the time of surgery was 4.12±3.63 years. Mean time of cochlear implantation 4.01±1.21 years.(table 2)

Table 2: Detailed demographics of surgery and cochlear implants

Variables	Mean	Standard Deviation
Mean age at the time of surgery	4.12	3.63
Mean time of CI	4.01	1.21

We found that the improvement in communication with the known people was 23 (51.1%) and before cochlear implantation effectiveness of hearing aids were slightly low 11 (24.4%).(table 3)

Table 3: Improvement in communication and hearing aids before CI

Variables	Frequency	Percentage
Improvement in Communication		
Agree	23	51.1
Disagree	22	48.9
Hearing Aids before CI		
Agree	29	75.6
Disagree	11	24.4

Table 4: Improvement in social relationships

Variables	Frequency (n=45)	Percentage
Social relationship		
Agree	22	48.9
Disagree	23	51.1
family well-being		
Agree	26	57.8
Disagree	19	42.2
Relationships with family		
Agree	30	66.7
Disagree	15	33.3
Educational conditions		
Agree	20	44.4
Disagree	25	55.6
Self- reliance		
Agree	31	68.9
Disagree	14	31.1

We found that the improvement of social relationships, family well-being, within-family relationships, educational conditions, and self-reliance were all observed to be satisfactory.(table 4)

DISCUSSION

Eiser and Morse discovered that parents of children with chronic illnesses were more likely than parents of healthy children to agree on what constitutes a good quality of life for their children. Due to the fact that deaf children are more dependent on their parents and must visit the hospital more frequently than children who do not have, their parents may be more aware of difficulties relating to their children's QoL than parents of hearing children.[15]

In this cross-sectional study 45 children of ages 3-10 had cochlear implants were presented. Among 45 cases, majority of the patients 27 (60%) were males and 18 (40%) were females. 6.07±3.32 years were the mean age of the children. Findings of current research showed resemblance to the previous study.[16] 24 (53.3%) cases were from urban areas and 19 (46.7%) patients had rural residency. Majority of the mothers 29 (64.4%) were housewives and 21 (46.7%) mothers were literate.[17,18] In current study mean age at the time of surgery was 4.12±3.63 years. Mean time of cochlear implantation 4.01±1.21 years.[19] Parental satisfaction was found to be high in the study based on parents' perceptions of their children's happiness, communication, and talkative natures. During the course of this study, a significant shift occurred in the way people communicated with each other. Other studies have shown significant increases in communication skills, social interactions, and self-reliance as a result of implementing the programme [20]. In this study, parents indicated that calling their children was the most effective way to get their attention, making it simpler for the family to communicate. [21] We found that the improvement in communication with the known people was 23 (51.1%) and before cochlear implantation effectiveness of hearing aids were slightly low 11 (24.4%).

Social ties, family well-being, within-family relationships, educational circumstances and self-reliance were all determined to be adequate, according to our research. This study was conducted after implantation, therefore it is likely that the children's speech quality has improved as a result. According to the findings of this study, the vast majority of parents (68.9%) believe that their children are completely dependent on their implant. Interviews with young people who had implants revealed a dearth of knowledge regarding their implant systems in a more recent study [22]. There was a considerable drop in parents' self-esteem as well, according to Archbold and colleagues [23]. After implantation, the child can fully participate in family life by speaking the same language of their siblings and grandparents.[24] For parents, education is still a big concern. However, a considerable number of parents state that they are concerned about their child's future and believe that he or she is behind other children of the same age. As a result of cochlear implantation, many people believe that their ability to attend a regular school is a good indicator of their overall well-being.[25]

Since there are so many variables involved in the implantation and development of children with cochlear implants, it is only natural that some variables have a major effect on one set of children but not on others, which is why this and previous research yielded a wide range of outcomes. [26] Overall, the quality of life was affected by five of the variables that were studied. A powerful predictor of a child's growth and quality of life, family receptivity emerged as one of the most significant variables when studied individually. Consider the many variables that affect the development of children with CI, and the complexity that comes with controlling all the contributing factors involved in CI diagnosis, adaption and monitoring. [27] It is not enough to achieve a desired balance between the variables studied to guarantee the full performance of auditory, language, and quality of life abilities.

The majority of parents are satisfied with the implantation procedure's results. Once implanted, the child's social bond, a sense of family well-being and a readiness to speak with their

parents have been established. In order to get a clear picture of how a child uses the implant in everyday life, we need to look at the child's audiometric data. As a result, they are frequently used in conjunction with indicators of language proficiency and academic achievement. Following cochlear implantation, children with congenital deafness can achieve speech and language achievements comparable to those of their hearing peers. It's important for parents to be patient because improvement takes time, and many are still concerned about their children's future education and self-sufficiency. For example, in the evaluation, treatment, improvement, improvement, improvement, and improvement, the speech and language pathologist has a vital role to play in each stage. [28]

CONCLUSION

In this research we concluded that the cochlear implantation was significantly helpful for children in hearing, language understanding, self-reliance, educational conditions. An understanding of the child's and family's unique needs will aid in the development of personalized speech therapy, which can help enhance outcomes for rehabilitation.

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