

Original Research Paper

STATUS OF AUDITORY HABILITATION IN INDIA

Rahul Aravind* MASLP, Ph.D Scholar *Corresponding Author

Dr. T. A. Subba Rao Ph.D

ABSTRACT Prospective clinical research was conducted on 25 children who received cochlear implantation and undergoing auditory habilitation in India. In this study, a questionnaire was provided to the caretakers of 25 children and the data were evaluated based on a questionnaire pertaining to general information collected and information collected about cochlear implants of children. On the auditory cortex, the effects of Cochlear implants were studied. Statistical analysis was performed for the responses and was recorded based on the interviewee answers. The survey's findings reveal inadequacies in the vast majority of areas where AV action should be concentrated.

KEYWORDS : Deafness, Habilitation, auditory, cochlear implant, implantation, language skills, speech,

interviewee.

INTRODUCTION

Hearing loss has been linked to a decrease in working memory, which is thought to have a role in older individuals' difficulty interpreting speech in difficult listening conditions (Roup et al., 2018). We frequently "listen back" to what someone just said during a discussion, with the recall of those sounds becoming the focus of our attention (Casoojee 2021, Panda 2019). This capacity could be especially useful for hearing-impaired older persons (Garami et al., 2020). Hearing loss is the most frequent sensory deficit in newborns, and it causes substantial injury to both infants and their families if left untreated (Percy smith et al., 2018). Every day, 77,756 live children are born in India, bringing the total number of newborns to roughly 25 million per year (Moeller et al., 2007) with approximately 1.5 lakh infants born with hearing loss. These youngsters have no chance of being identified and treated early (Bharati et al., 2022). As a result, the majority of these youngsters struggle with spoken communication, academic performance, psychological and cognitive development, and socioeconomic insecurity (Ansari et al., 2021). Deep sensorineural hearing loss is treated by cochlear implant (CI) technology (SNHL). For CI applications (Venkataramani 2021, Makar 2021) an intact cochlea and cochlear nerve are required (Sampathkumar et al., 2021). In disorders that may occur in these areas (Dev et al., 2019), CI is ineffective, and direct stimulation of the cochlear nuclei is required to maintain auditory conduction (Browing et al., 2020). Auditory brainstem implant (ABI) applications have been created to assure this auditory continuity (Sharma et al., 2020). Although auditory information can aid lip-reading, its benefits in terms of speech perception are often limited (Gunes, 2022). Universal newborn hearing screening (UNHS), digital hearing aids (HA), and cochlear implants (CI) have all enhanced the quality of life for children with hearing loss (HI)(Raghunandhan et al., 2014).

METHODOLOGY

(1) Criteria for selection of children

(a) Implant status: Only one ear of each of the 25 children had received cochlear implantation. The second ear has not yet been implanted, therefore these children are only receiving amplification in one of their ears. Some people use air conduction hearing aids, but the majority doesn't because they don't see the benefit.

(b) Age of implantation: Even though some of the children were diagnosed at an earlier age, they were all implanted at various ages. Somewhere using air conduction hearing aids in the hopes of a positive outcome, while elsewhere, developmental maturation is being suspected. However, 9 children had surgery before the age of three, 9 children were implanted between the ages of three and five, and the other 7 children were implanted between the ages of seven and eight. (c) Usage of hearing aid before cochlear implantation: Before opting for CI, which may help to stimulate the residual hearing in children with severe to profound hearing loss, the advantage of hearing aids must be ruled out. Before CI, nine hearing-impaired youngsters used hearing aids regularly, 8 children used them infrequently, and another 8 children had never used hearing aids despite being told they should.

(d) The age range of start of AVT after switch-on: The CI must be followed by auditory training to teach the implantee sound and thus language. The best time to turn on the device and begin AVT is two to three weeks following CI. Within a month, all of the children began receiving AV intervention, which was more or less on schedule.

(2) Data collection

For the study, a questionnaire-based analysis was used. The poll required the primary caretakers of the implanted children, either father or mother, to participate. It was made a point to avoid their concerned AVT specialists and professionals during the survey in order to eliminate any bias. Each question in the material was explained to the interviewee, who was then instructed to encircle the proper responses. For each question, the responses of 25 children were combined and a percentage score was generated. The 25 youngsters were all born with hearing loss in both ears and had hearing aids placed in one ear at different periods. The children chosen for the study were those who met the Ministry of Health and Social Welfare's criteria for cochlear implantation. This survey was carried out in 20 aspects given for obtaining responses for the services available for people children who underwent Cochlear Implantation (C.I). This questionnaire indeed was divided into two parts.

(3) Data analysis

The data were subjected to a qualitative analysis. For each of the questions, percentages were determined based on responses from various caretakers and children. The patterns have been finalised after getting the percentage values.

RESULTS AND DISCUSSION

1. Information regarding available resources for treatment

A newly implanted pre-lingual hearing impaired individual resembles a new born in their auditory abilities. They have to undergo systematic, structured and intensive auditory training immediately. 8% of the primary caretaker feels that the information regarding treatment is easily available, 4% feels that the information is sufficient, 68% feels that the information regarding treatment is difficult to gather whereas 20% feels the resources for treatment are insufficient.

2. Information available on how to communicate with the deaf child

It is always challenging to communicate to a newly implanted pre-lingually deaf individual. The communicators have to use some special strategies since they lack auditory input so far and needs some supporting strategies. 64% of the caretakers identify the information available to be insufficient.

3. Guidance available on how to encourage child's communication strategies

The language acquisition and performance of the implantee depends on the effectiveness of intervention strategies to foster communication. 24% of the primary caretakers feels that the guidance available is sufficient whereas 76% feels that guidance on how to encourage childs communication strategies are not adequate.

4. Information regarding role of parent and caretaker in a deaf child's world

The primary caretaker or the parent who influences the implantee the most has a critical role to play in childs interventional aspects and training. Hearing impaired child needs special attention from caretaker for which they have to be educated and trained. 28% feels that the information regarding role of primary caretaker in a deaf childs world is clear whereas 72% feels that they lack managing skills.

5.Information related to role of family members in the treatment of a hard of hearing child

The family members too have a vital role to play in an implantees learning life providing nurturing environment and reinforcement. 4% could identify the resources satisfactorily whereas 96% couldn't identify the resources at par.

6. Information related to availability of structured AVT in English language

The auditory training provided in deaf childs world lacks a standard protocol. Instead it's an evidence based practice believing on natural stimulatory environments. The availability of structured AVT in English language is identified to be 16% whereas 84% reports the non-availability of a habilitation guide.

7. Availability of structured AVT in mother tongue

The AV intervention efficacy will be more if it could be provided in mother tongue. 84% of the children have access to AVT in mother tongue.

8. Information available regarding natural sequential patterns of stimulation

The AV intervention will be more effective provided natural and realistic ways of stimulation could be availed. 44% reports that the pertaining information's are difficult to gather whereas 56% reports that the information is insufficient.

9. Information regarding guidance from abroad

The AV intervention is believed to be more structured and effective in abroad countries. The amount of guidance available from such sources like Availability of western treatment materials, Online resources, Training packages, Softwares, Applications etc depicts that the information is accessible only for 12% of the implantees.

10. Information regarding qualified, skilled and dedicated clinicians

The availability of qualified, skilled and dedicated clinicians is the key element in AV intervention. The survey has identified the availability of such good professionals to be 32% whereas 68% reports reduced efficacy of AV professionals.

11. Contribution of AVT specialist in designing the support needed for cochlear implantee with respect to family

The family members of the AV client too provide a key role in the communicative development. This needs to be clearly identified and formulated wherever necessary based on the family background and necessities. 76% of the implantees are not getting the concerned advice and support plans from the AV specialist.

12. Consideration of family's culture and lifestyle when working out support plans

The home training activities and its parameters needs to be designed by the AV specialist studying their family's cultural aspects and lifestyle. 28% only has reported it to be satisfactory.

13. Information regarding the support from all professionals together in co-ordination

AV intervention can more or less be considered as a multidisciplinary approach consisting of Audiologist, Speech Language Trainer, AV specialist, Psychologist etc. The availability of support from all the professionals together is reported to be around 24%.

14. Information regarding regular monitoring of the implantees hearing levels and necessity by the specialist

The hearing levels of the implantees need to be monitored through Neural Response Telemetry or related procedures based on the type of implant done which is responsible for the sequential communicative development of the implantee. 56% has reported it to be satisfactory whereas 44% reports it to be insufficient.

15. Information regarding follow up of things as per treatment plan

An age matched AV treatment plan will help in the better monitoring of achieved milestones and lacking areas which can track prognosis easily. It is also essential to formulate future plans. 80% of the implantees report it to be inadequate.

16. Involvement of AVT specialist with implantee, primary caretaker and family members

The AV specialist themselves becomes a lead caretaker of the implantee wherein they have to frequently interact with family members and build a good rapport. 44% of the implantees reports limited or absence of interaction with immediate family members.

17. Knowledge and ability of AVT specialist in trouble shooting the implant under emergency conditions

Cochlear implant processor, battery and its accessories has to be inspected before the commencement of each AV session. Basic trouble shooting needs to be done by the AV specialist since its impractical to depend on technical person always. 56% of the implantees get benefited from the AV specialist itself whereas 44% required toescalate it to the next levels for rectification.

18. Average time of AVT intervention undergoing per month

The language development and communicative ability depends on the time exposed to AV intervention. 8% are getting AV intervention more than 30 hours a month, 48% are undergoing 21-30 hours a month, 12% gets 15-20 hours a month whereas 32% are receiving AV intervention only less than 10 hours a month.

19. How frequently mapping is performed and updated?

Mapping or configuring the implant device to the optimal hearing levels should be done whenever needed to assure proper amplification. 20% of the implantees is getting the service whenever required, 12% is getting on a monthly basis, 32% on a quarterly basis and 36% in half yearly basis.

20. Average time of Audiology services availed per quarter for checking the performance and maintenance of cochlear implant.

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The audiologist is the concerned technical person for immediate escalation after AV specialist. The audiology services availed per quarter is found to be 1-2 hours for 28% of the implantees whereas less than an hour for 72% of the implantees.

The outcomes of the survey points to limitations in majority of the realms where AV intervention should be more focused. This could be due to the lack of awareness, limited resource centres, limited professional expertise, limited technical support and moreover unaware of the global consequence and call of action in this respect. Early intervention and fulltime use of hearing equipment, as well as family-centred auditory-verbal intervention (Swain, 2022), have been found to help children bridge the language gap (Lawrence et al., 2020) and develop age-appropriate language before starting school for this new generation of children with HI (Arumugam et al., 2021). Up to 90% of daily language acquisition is due to overhearing (Wischmann et al., 2022).

Limitations and Contributions.

The study attempted to comprehend the fundamental components of AVT as well as the significant issues that have arisen. As a result of this survey, there is a need for improvement in terms of therapeutic approaches that take into account the challenges and concerns of parents. The survey's findings point to shortcomings in the vast majority of areas where AV action should be concentrated. This could be due to a lack of awareness, a scarcity of resource centres, a scarcity of professional competence, a scarcity of technical support, and a lack of understanding of the global implications and call to action.

Conclusion and Recommendation

Using a Cochlear implant to restore auditory system input from a young age can provide the stimulation required to maintain auditory pathways. However, as revealed in this study, if auditory input is not restored until beyond this stage of development, the crossmodal rearrangement pathways may exhibit abnormal functional properties. Finally, cochlear implants assisted youngsters with profound hearing loss to learn to speak while also improving their hearing abilities. The issue of consanguinity producing a hearing loss in offspring as a result of the admixture of defective gene pools that run in families, as well as competent genetic counselling, must be addressed.

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