

Expanding Criteria in Candidacy for Cochlear Implants leads to Newer Trends in Auditory Habilitation

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Editorial

Multichannel Cochlear Implantation (CI) has been established well over the last four decades to be a time-tested safe and effective technology for hearing restoration among individuals with congenital or acquired bilateral severe to profound cochlear hearing loss. This is the first electronic circuitry which the human central nervous system has integrated well with in order to restore a lost special sense, leading onto the popular term "bionic ear".

The last decade has been the most exciting for the field of cochlear implantation, whereby technological advancements have led to sophistication of the internal and external devices, soft insertion hearing preservation electrodes, bilateral simultaneous CI, Electro-acoustic (EAS) dual processor stimulation, devices with better compatibility for MRI scans (MedEl Synchrony), speech processors with precise clarity for speech understanding in a variety of natural environments and also music perception. The candidacy criteria for CI expanded not only because of the improvements in technology and design of implants, but also due to our better understanding of consequences of hearing loss on development and educational needs among the paediatric population. Thereby early intervention in children with bilateral CI prior to total loss of hearing has yielded better outcomes with regards to their education and to integrate them into our society as normal individuals with a productive life [1-3].

The most important development has been the rapid evolution of candidacy for CI, to include those candidates who were considered not ideal for implantation. Today, this encompasses individuals even with Single sided Deafness (SSD) and Asymmetrical Hearing Loss (AHL). SSD is where one ear has normal hearing and the other is profoundly deaf for which contralateral re-routing of acoustic signals through bone conduction implants was the norm in the recent past until CI was approved. AHL is where one ear is profoundly deaf while the other ear is supported by a hearing aid with thresholds ranging between 30 to 90 dBHL and these are the candidates who will perceive true bimodal binaural hearing with two kinds of amplification devices [4].

CI benefits SSD candidates to regain binaural hearing, while in AHL it has significantly improved the quality of life for these individuals who without the implant would have struggled at the maximal limits of conventional amplification through hearing aids. The British Cochlear Implant Group journal 'CI International' also came out with a special edition in 2014 reviewing these interesting developments in candidacy with a forethought regarding implementation of the services in their National health Services, while looking at the cost-benefit ratio of funding CI through their annual health budget.

This expanded criteria has also led to a revolution in the way CI is programmed globally. Conventional CI programming follows the basic

mapping law entirely focused on setting the electrical thresholds individually for each ear while not considering the contribution of the contralaterally stimulated ear. With the evolution of bimodal hearing trend, now often the challenge for audiologists is to program the hearing aid along with CI to make use of true binaural bimodal (electrical+acoustic) hearing.

The recommendation today is to have a multidisciplinary assessment by clinicians, implant audiologists, habilitationists, child psychologists and special educators while keeping in view the functional needs of a patient and by taking cognizance of limited progress through inadequate amplification to make an early and appropriate decision to help such candidates who are currently out of audiological criteria to be fitted with CIs. Every clinician and surgeon should critically assess the standard criteria for cochlear implants and aim for inclusion of those individuals who may benefit with these new expanded and evolving selection criteria. The most important consideration when thinking about changing candidacy for CIs for both adults and children should not only be the cost of device and surgery but the assessment of the impact on lives and on society of not providing implants to these appropriate candidates [5].

A new worldwide consensus is now being developed to study the speech discrimination patterns, spatial orientation to complex sounds, auditory perception in noisy environments and hearing related quality of life benefits for individuals with binaural bimodal hearing. Thereby a variety of combinations are being investigated namely -CI with H.Aid, CI with BAHA, CI with middle ear implants etc. Their long term outcomes are expected to be available in literature by 2020, through an ongoing multicentric research work funded by the US government. Success from this work will signal exciting times ahead for a range of deaf individuals in the future. Certainly a wave of change is happening in the present day whereby each ear is considered individually for hearing impairment and the best choice for combined hearing restoration for both ears is offered for achieving the holistic benefits as provided in nature-two ears are better than one and when both are optimally utilized!

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