

Exploring the impact of auditory, visual, and cognitive abilities on cochlear implant outcome

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Introduction and aim: Speech understanding outcomes after cochlear implantation (CI) exhibit considerable variability [1, 2]. The process of speech understanding is considered a bi-modal and bi-directional process, whereby also visual information (speechreading) and cognitive functions (top-down processes) are involved [3, 4]. Given the complexity of speech understanding, it is suggested to consider a broader variety of factors than only auditory factors in the follow-up of CI-candidates. Therefore, the current study aimed to evaluate the outcome for auditory, visual, and cognitive abilities on the short- (three months and six months) and long-term (twelve months) after implantation.

Material and methods: Twenty-six CI-candidates, according to the Belgian criteria for reimbursement, were assessed before implantation, and at three, six, and twelve months post-implantation. Auditory abilities were evaluated using pure-tone audiometry, speech audiometry in quiet and in noise, while the (audio-)visual speech processing was assessed using the Test for (Audio-)Visual Speech Perception [5]. Cognitive assessments included the Letter-number sequencing task [6], Letter Detection Test [7], and an auditory Stroop test [8]. Hearing-related quality of life was investigated using the hearing-related quality of life questionnaire for Auditory-Visual, COgnitive and Psychosocial functioning (hAVICOP) [9]. Descriptive parameters were established and the effect of test moment was investigated statistically with Linear Mixed Models.

Results: Preliminary findings show overall improvement in auditory, visual, and cognitive abilities post-implantation, with the most significant gains observed between pre-implantation and three months post-implantation. Furthermore, a large improvement is seen in hearing-related quality of life after implantation. Currently, data analysis is ongoing. The final results will be presented at the at the Spring Meeting of B-ORL.

Conclusion: This study aimed to investigate the outcome for auditory, visual, and cognitive abilities after CI. As such, more insight in the different abilities contributing to speech understanding could be provided. In the future, these results could provide useful information for the counseling and rehabilitation after CI.

References:

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