ABSTRACT

**Objectives:** The main objective of this study is to compare telephone speech perception and subjective preferences among a population of cochlear implant users with two different speech processing strategies: CIS and FSP.

**Methods:** A randomized double-blind clinical trial was designed for intra-individual comparison of two different coding strategies: continuous interleaved sampling (CIS) and fine structure processing (FSP). Postlingually deaf patients using MedEl/PulsaQ CI were included. Subjects consecutively were tested with both strategies, the first of which was randomly assigned. Tests were performed 6 weeks after each fitting. Using dichotomous words, speech perception was tested under five different situations: landline with (LWN) and without (LWoN) background noise, mobile network with (MWN) and without (MWoN) background noise, as well as mobile network using a Bluetooth magnetic field transmitter necklace (MB). Assessment of personal preferences between the two strategies was obtained at the end of the study. Data were analyzed using SPSS 10 for Windows XP SP2.

**Results:** 25 subjects were included. Patients performed better with FSP in comparison of CIS (-9% improvement of 11.5% for LWN (p<0.01), CIS95%=9-20%) and 10% for MWoN (p=0.001), CIS95%=5-15%). Mobile network showed significant improvement for FSP strategy without background noise (MWoN, p=0.001, CIS95%=5-17%). MB tests showed an improvement of 11% (MWoN, p=0.001, CIS95%=15-22%). We found a significant difference in patients' preferences favoring FSP strategy. However, BTLink showed a significant difference in speech recognition in difficult situations for cochlear implant users, such as telephone use, over CIS strategy.

**Conclusions:** In general, our results show better speech perception when subjects are programmed with FSP. An overall improvement of 10% is demonstrated for quiet conditions, falling to 6% in the noisy environment. Results are disappointing when using the Bluetooth magnetic field transmitter necklace, probably due to the fact that the study design didn’t allow any training prior to the tests. However, we were able to identify a subgroup of three patients in whom mobile tests were impossible to perform due to signal distortion. They achieved some discrimination when using BTLink, showing that these can be good candidates for magnetic field transmitters.

When comparing two different coding strategies in the same subject, we must take in consideration the sequence in what they are tested. Our results show that FSP speech coding strategy lead to an improvement in telephone speech perception over CIS strategy. On subjective tests patients prefer FSP over CIS. Further studies are needed to assess the benefit of aiding systems.