Comparison of Three Different Hearing Aid Fitting Formulae to Verify the Benefit of Artificial Intelligence Based Formula

Thesis

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Audiology

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Abstract:

BACKGROUND: There is a great need to provide the patients with the most suitable hearing aid for a better life.
OBJECTIVE: To compare National Acoustic Laboratories non-linear version 1 (NAL-NL1), desired sensation level version 5 (DSLv5) to a manufacture-specific NAL-NL1-based fitting formula in a ChannelFree^{TM} artificial intelligence parallel processing HA to verify its benefit**.**
METHODS: The study comprised 30 adults and children with bilateral moderate to severe sensorineural hearing loss, monaurally fitted with non-linear HA. Comparisons were based upon aided speech intelligibility in quiet and in noise, aided sound field thresholds, functional gain across frequencies and functional performance in real life using APHAB, COSI and GHABP questionnaires. **RESULTS:** The 3 formulae have significantly improved speech discrimination in both adults and children. The 3 formulae have significantly improved functional performance in real life speech communication with the NAL-NL1-based formula showing the greatest degree of benefit and improvement of listening needs followed by NAL-NL1-then DSL. But, amplification with the 3 formulae increased aversiveness to environmental sounds. Children reported significant benefit using DSL while adults reported significant benefit using NAL and NAL-NL1-based formulae. SPIN test correlated well with real life speech communication.
CONCLUSION: The 3 fitting rationales have equally improved intelligibility with variable degrees of improvement in real life speech communication with preferences of DSL in children and NAL-NL1 and the manufacture-specific NAL- NL1-based formula in adults.

Key Words: adults, artificial intelligence, ChannelFree^{TM}, children, DSL, fitting rationale, non-linear hearing aids, NAL-NL1, prescriptive formulae.

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