P097

AUDITORY IMPLANTS
BONE CONDUCTION AMPLIFICATION

Subjective and audiological benefit of BONEBRIDGE (BCI602) with two different fitting strategies

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Background

The Bonebridge (BB) is a partially implantable active transcutaneous bone conduction hearing system. For the fitting of BB the hearing thresholds of the patient are entered into the software and one of three algorithms (DSL v5, NAL-NL1 or NAL-NL2) is selected to calculate the best fit. In 2017 Hodgetts & Scollie [1] introduced a new fitting algorithm called DSL-BCD. The DSL-BCD algorithm was developed especially for the characteristics of bone conduction devices.

Objectives

To verify the influence of two different fitting procedures (namely DSL v5 (A) and DSL-BCD (B)) on hearing performance and subjective benefit of BB BCI602 in experienced BB users.

Methods

Patients with unilateral and/or bilateral conductive or mixed hearing loss in indication range implanted with a BCI602 device and at last 3 months of experience were enrolled.
In a single time-point comparison design, subjects were evaluated with the standard DSL v5 first fit (A), the simulated DSL-BCD first fit (sDSL-BCD, B) and their own fitting with adjustment for best fit (C).
Sound field thresholds were obtained in the three fitting conditions. Moreover, the word recognition score was measured both at 65 and 45dB SPL in quiet. For measuring speech intelligibility in noise the International Matrix Test (Oldenburg) was used with fixed noise level at 65 dB SPL and adaptive speech level from S0N0.
Additionally a custom made questionnaire to ask the patient what condition A or B was preferred in several listening scenarios during the trial time was used.

Evaluation scheme	Visit 1 (pre-op)	Visit 2** (activation / week 0)	Visit 3 (week 2-3 after activation)	Visit 4 (week 4-6 after activation)
Informed consent	X			
SAMBA 2 fitting (after measurements)		Condition A*	Condition B*	Setting to favorite
Vibrogram		X for remote fitting		
Pure tone thresholds (AC/ BC; bilaterally)	X	X (only BC***)	Optional: BC	
Sound field thresholds	Unaided	New patients own fitting / Acute A / Acute B*	Condition A* / Unaided	Condition B* / Acute A*
Speech in quiet (sound field; S0)	Unaided	New patients own fitting / Acute A / Acute B*	Condition A* / Unaided	Condition B* / Acute A*
Speech in noise (sound field; S0N0)	Unaided	New patients own fitting / Acute A / Acute B*	Condition A* / Unaided	Condition B* / Acute A*
SSQ12 questionnaire APHAB questionnaire	Unaided		Condition A*	Condition B*
Preference questionnaire		X		X
Wearing Times			As per data-log and user feedback	As per data-log and user feedback

Results

Seven experienced BB users participated. Of these, 5 were adults (age at implantation: 40±19 years; time since surgery: 31±12 months) and 2 children (age at implantation: 5±4 years; time since surgery: 34±7 months).
Sound field outcomes: 40±12dB (A), 34±4dB (B), 36±7dB (C) (Fig.1).
Speech in quiet at 65dB SPL: 94±5% (A), 96±5% (B), 89±8% (C).
Speech in quiet at 45dB SPL: 50±34% (A), 74±25% (B), 67±27% (C) (Fig.2).
Speech in noise: -4.0±1.8dB SNR (A), -3.6±0.9dB SNR (B), -4.1±0.8dB SNR (C) (Fig.3).
Although not significant, we found better outcomes with the new first fit sDSL-BCD compared with the current standard first fit DSL v5. The questionnaire reported a preference for the sDSL-BCD fitting mainly in terms of sound clarity and volume.

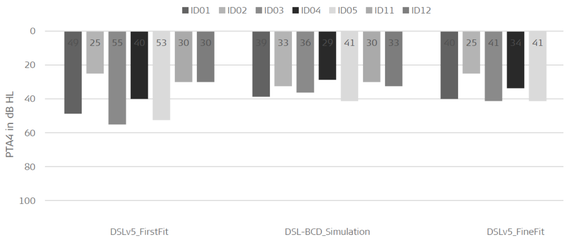

Fig.1.*Sound field outcomes*

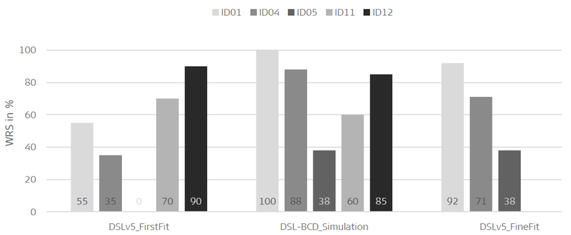

Fig.2.*Speech in quiet at 45dB, S0*

Conclusion

This study represents the first clinical evidence proving feasibility of DSL-BCD as first fit for BB. More data both from experienced and non-experienced BB users are needed to confirm these results.

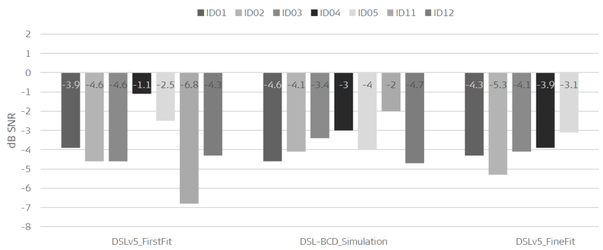

Fig.3.*Speech in noise, S0N0*

References

[1] Hodgetts WE, Scollie SD. DSL prescriptive targets for bone conduction devices: adaptation and comparison to clinical fittings. Int J Audiol. 2017 Jul;56(7):521-530.

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