P 483

SPEECH AND LANGUAGE

Perceptive and Linguistic results in Early Cochlear Implantation in Children

Scales and parental questionnaires for very young children with CI

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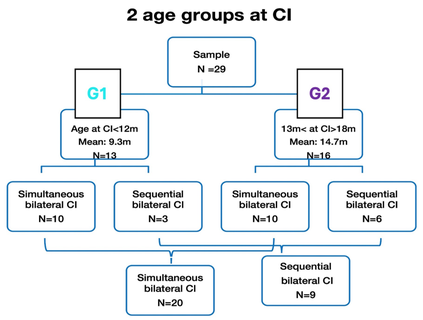
Aim

Evaluate the impact of early cochlear implantation (CI) on perception and language in children.

Population

Inclusion criteria
- Neonatal screening
- Severe to profound deafness
- Congenital deafness
- Bilateral implantation
- At least one CI fitted before 18 months, between 2015 and 2020
- Necker Hospital, Paris

Exclusion criteria
- Associated disorders
- Progressive deafness
- Gap between the 2CIs>2 years



Student's Test on mean age between G1 and G2 : $t(27) = 10,17$; $p < 0,0001$

Figure 1. Representation of the population (n=29). Two groups were formed according to age at CI: G1 (n=13) CI <12 m (mean age at CI: 9.3m) and G2 (n=16): CI >=12m (mean age at CI = 14.7m). Bilateral simultaneous CI was performed in 10/13 and 10/16 children respectively in G1 and G2.

Methods

- The evaluation was performed pre operately and post operately at 3, 12 and 24 months follow-up by speech-therapists and parents.
- Speech perception was assessed by the Category of Auditory Performances Scores (CAP), or the Meaningful Auditory Integrative Scale (MAIS) and speech production by the Meaningful Use Speech Scale (MUSS) and Speech Intelligibility Rating (SIR)
- Analysis included ANOVAS and Spearman correlations analysis.

	Scales	Parental questionnaires
Speech perception	CAP[1]	MAIS[3]
Speech expression intelligiblity	SIR[2]	MUSS[4]

Table 1. Representation of scales and parental questionnaires at each pre- and post-CI assessement.

Results

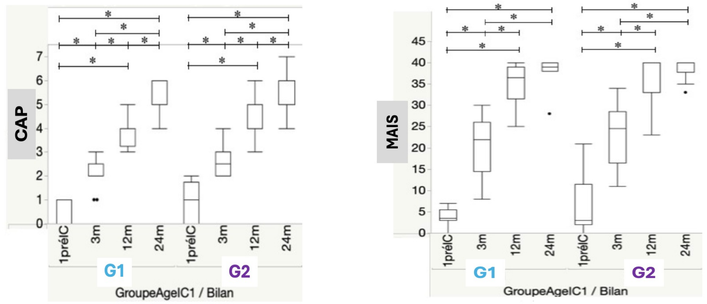


Figure 2. Representations of CAP and MAIS scores for 2 groups at pre-CI, 3, 12, 24 months follow-up

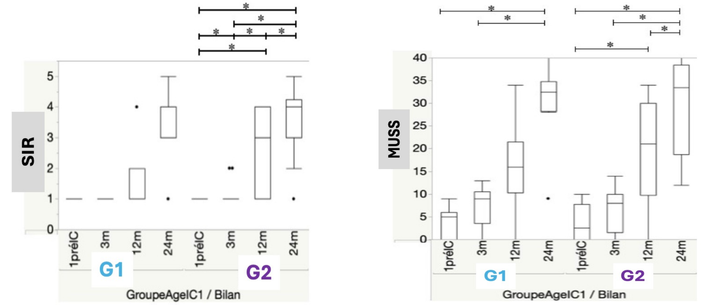


Figure 3. Representations of SIR and MUSS scores for 2 groups at pre-CI at 3, 12, 24 months follow-up

	CAP	MAIS	SIR	MUSS
Inter-group results	The main effect of the Groups factor is not significant : [F(1,16) = 1.523, p = 0.235].	The main effect of the Groups factor is not significant [F(1,16) = 0.380, p = 0.547].	The main effect of the Groups factor is not significant [F(1,7) = 0.041, p = 0.845].	The main effect of the Groups factor is not significant [F(1,16) = 0.001, p = 0.977].
Intra-group results	The main effect of CAP evaluation modality is significant: G1 [F(3,18) = 83.728, p < 0.01] G2 [F(3,30) = 174.362, p < 0.01].	The main effect of MAIS evaluation modality is significant: G1: [F(3,18) = 126.572 , p < 0.01] G2: [F(3,30) = 126.906, p < 0.01].	The main effect of SIR evaluation modality is not significant between the 4 measures for G1 [F(3,9) = (5.743 , p = 0.018]. The main effect of SIR evaluation is significant for G2 [F(3,12) = 20.211, p < 0.01].	The main effect of MUSS evaluation modality for G1 is significant between the pre-CI assessments and the 24-month post-CI assessment and between the 3-month and 24-month post-CI assessments. For G2: differences between all the assessments (except between pre-CI and 3 months).

Table 3. ANOVA's results of CAP, MAIS, SIR and MUSS for 2 groups at pre-CI, 3, 12, 24 months follow-up

Correlations

At 12 months post-CI

G2 : same at 24 months post-CI
G1 : no correlation → link with developmental age

At 24 months post-CI

G1 and G2 :
- Perception CAP and MAIS correlated
- Correlated CAP and SIR : perception and intelligibility
- G2 : MUSS and SIR correlated : expression and intelligibility

Strong significant positive correlations
Spearman tests : p>0.003 ; 0.5>p>0.8
- For G1 : at 24 months post-CI
- For G2 : at 12 and 24 months post-CI

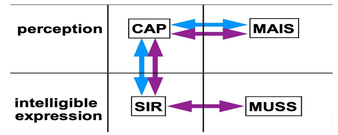


Table 2. Representation of correlations between CAP, MAIS, SIR and MUSS for groups G1 and G2

Interpretations

- Results of scales and parental questionnaires evolve similarly for both groups of early implanted children at all post CI evaluations.
- There is less dispersion of scores for G1 than for G2
- Correlations between scales and questionnaires are observed for both groups at 24 months post CI.
- SIR scale and MUSS parental questionnaire are correlated at 12 and 24 months post CI exclusively for G2 due to development trajectory and entry into oral language.
- For G1: MUSS questionnaire is not precise enough and therefore underrates the evolution of very early implanted children.

Conclusion

Early implantation enables rapid, effective rehabilitation of perception and quality language development. CAP SIR scales and MUSS MAIS questionnaires cannot, at an early stage, highlight the subtle differences that may exist in the development of early-implanted children. A long-term study including language comprehension data could be useful.

References

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