Perception and production of emotional and linguistic prosody in children with cochlear implants

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Primary Objective: in what way, if any, do children with cochlear implants process prosody differently from each other and from normally hearing children?Secondary Objective(s): 1) is there a processing difference between linguistic and emotional...

Ethical review	Approved WMO
Status	Recruiting
Health condition type	Inner ear and VIIIth cranial nerve disorders
Study type	Observational non invasive

Summary

ID

NL-OMON40438

Source
ToetsingOnline

Brief title
Prosody development with cochlear implants

Condition

- Inner ear and VIIIth cranial nerve disorders

Synonym
inner ear hearing loss, sensorineuronal hearing loss

Research involving
Human

Sponsors and support

Primary sponsor: Universiteit Leiden
Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: Cochlear implants, Development, Emotions, Prosody

Outcome measures

Primary outcome

Pretest 1 - Colour and object identification and naming using a picture naming paradigm. Percentage correct.

Pretest 2 - Visual emotion recognition using emotional faces. Percentage correct.

Pretest 3 - Discrimination or intonational differences using a reconstruction of the ASSE test for prosody (Auditory Speech Sound Evaluation). Percentage correct.

Pretest 4 - Nonword repetition. Percentage correct.

Test 1 - Recognition of emotional prosody by identification of the emotion from spoken sentences. Percentage correct.

Test 2 - Recognition of linguistic prosody by identification of the sentence accent in spoken sentences. Percentage correct.

Test 3 - Emotional prosody production. Percentage correct. Of each trial, the verbal response is digitally recorded. This percentage is determined on the basis of judgments by an independent, to be recruited, panel of healthy adult speakers of Dutch as a mother tongue. They will judge which of the 4 emotions was conveyed plus how certain of their judgment they are for each judgment.

Test 4 - Linguistic prosody production. Percentage correct. Of each trial, the verbal response is digitally recorded. This percentage is determined on the basis of judgments by an independent, to be recruited, panel of healthy adult

speakers of Dutch as a mother tongue. They will judge which of the 2 possible

focus positions was expressed plus how certain of their judgment they are for

each judgment.

Secondary outcome

Pretest 1 - Colour and object identification and naming. Mean response time.

Test 1 - Emotional prosody perception. Mean response time.

Test 2 - Linguistic prosody perception. Mean response time.

Study description

Background summary

Prosody - rhythm, stress and intonation - is the melody of language. It has many functions, but they can be divided into two types: linguistic and emotional prosody. Linguistic prosody tells you something about the meaning of a sentence, whereas emotional prosody tells you something about the speaker. If you cannot hear prosody, you miss out on essential information such as what the most important word (*focus*) and what the emotional content of the sentence is. This is to some extent the fate of users of cochlear implants (CIs), who, despite the device*s benefits for deaf people, have been shown to have great difficulties in discriminating several aspects of prosody, most importantly intonation because it is conveyed by pitch. Children with CIs have problems hearing emotions and risk having a delayed linguistic and socio-emotional development. This could in part be due to their lack of experience with prosody. The link between the way the voice is being perceived by CI recipients and the development of the communicative functions that are mediated by that voice is still not understood. This research aims to fill in that gap.

Study objective

Primary Objective: in what way, if any, do children with cochlear implants process prosody differently from each other and from normally hearing children?

Secondary Objective(s):
1) is there a processing difference between linguistic and emotional prosody?
2) is there a processing difference between left and right implanted children?
3) is there a processing difference between temporal and pitch related cues?
4a) is there a processing accuracy difference between production and perception

of prosody?
4b) is there a correlation between production and perception accuracy of prosody?
5) are there interactions in processing difference between any of the above conditions?

Study design

The design of this study is that of a comparison of behavioral intervention in two experimental groups and three control groups. All groups will perform the same set of behavioral tests.

The two experimental groups are:
a) a group of children with early cochlear implantation (around 1 year of age) and
b) a group of children with late cochlear implantation (around 4 years).
They all have equal time of experience (hearing age) with their implant.

The three control groups are groups of normally hearing children matched for
a) hearing age with all the patients
b) chronological age with the early implanted children
c) chronological age with the late implanted children

This design allows for testing if the total time of implant experience (comparison with hearing-age matched controls) is the factor that determines performance or if chronological age (i.e., general maturation) also plays a role (comparison with chronological-age matched controls). If it does, the study will reveal to what extent, if any, the patients* development is delayed with respect to that of typically developing peers.

Intervention

Participants are asked one hour and a half of their time (excluding time for traveling) to take part in 9 tests assessing accuracy and latencies of responses and including time for explanation and pauses. Travel expenses are reimbursed. We test the perception and production of emotional and one type of linguistic prosody in 4 tests. These 4 tests are preceded by 5 pretests for the baselines of general object/color naming, non-linguistic emotional processing, general intonation processing, general linguistic perceptive and productive developmental level and nonword repetition. Subjects respond by pointing at pictures on a screen (in some tests) and by giving a verbal reaction to a question (in other tests). Although responses can be wrong or right, feedback to the children will always be positive.

Study burden and risks

There are no risks in relation to participation in this study. The only discomfort is in spending time; this amounts to two and a half hours at maximum (including perhaps as much as an hour of pauses) altogether (excluding time for traveling if necessary). Travel expenses are reimbursed. This time investment is justified because it is the least that can be done to provide us with valuable insights into the socio-emotional and linguistic development of children with and without cochlear implants; with implants, because it shows us some of their capabilities and limitations in the use of prosody, information that could focus language and speech therapy onto what they have difficulty with; without implants, because should they ever acquire socio-emotional or communicational problems, we have learned that one of the possible factors correlating with them (i.e., causing them or being caused by them) is the processing (perception and/or production) of prosody.

This study can only be performed on children with CIs, because it is the only way to test the role of the sensitive period in early natural language acquisition (between 0 and 4 years). This is because CI children are the only population experiencing delayed onset of verbal language acquisition. Secondly, in order to know if CI children develop differently than normally hearing children of the same age or the same amount of language experience, real patients are needed. This could have implications for the way language and speech therapy for CI children is designed.

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)
Children (2-11 years)
Elderly (65 years and older)

Inclusion criteria

Patients: Having undergone cochlear implantation before the age of 1;6 (early implanted group) or 3;6 (late implanted group); having used the implant for a gross duration of between 3;0 and 3;6 years.;Controls: Aged between 3;0 and 3;6 (hearing-age matched); 4;0 and 4;6 (Younger Chronological-Age Matched Group); or 7;0 and 7;6 (older Chronological-Age Matched Group) Dutch nationality (all groups).

Exclusion criteria

Patients. Reported medical problems related to the CI; multilingual development; bilateral implantation.;Control groups. Reported audiological or psychosocial problems; multilingual development

Study design

Design

Study type:	Observational non invasive
Intervention model:	Other
Allocation:	Non-randomized controlled trial
Masking:	Open (masking not used)
Control:	Active
Primary purpose:	Other

Recruitment

NL

Recruitment status:	Recruiting
Start date (anticipated):	17-04-2015
Enrollment:	100
Type:	Actual

Ethics review

Approved WMO Date:	23-01-2014
Application type:	First submission
Review commission:	METC Leiden-Den Haag-Delft (Leiden) metc-ldd@lumc.nl

Approved WMO Date:	07-01-2015
Application type:	Amendment
Review commission:	METC Leiden-Den Haag-Delft (Leiden) metc-ldd@lumc.nl

Approved WMO Date:	15-07-2015
Application type:	Amendment
Review commission:	METC Leiden-Den Haag-Delft (Leiden) metc-ldd@lumc.nl

Approved WMO Date:	29-09-2016
Application type:	Amendment
Review commission:	METC Leiden-Den Haag-Delft (Leiden) metc-ldd@lumc.nl

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
CCMO	NL46040.058.13