Understanding the preference for noise reduction in hearing aids: untangling the perceptual effects of speech distortion and residual noise

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Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Hearing disorders
Study type	Observational non invasive

Summary

ID

NL-OMON35308

Source
ToetsingOnline

Brief title
Sound quality of noise reduction

Condition

- Hearing disorders

Synonym
hearing impairement, hearing loss

Research involving
Human

Sponsors and support

Primary sponsor: Academisch Medisch Centrum

Source(s) of monetary or material Support: -

Intervention

Keyword: noise reduction, preference, residual noise, speech distortion

Outcome measures

Primary outcome

The main outcome measures are the detection threshold for speech distortion and preference for different degrees of noise reduction. We will look for relations between those measures and other audiological characteristics (pure tone threshold, acceptable noise level, frequency resolution, temporal acuity, or speech intelligibility).

Secondary outcome

-

Study description

Background summary

One of the main reasons for hearing aid dissatisfaction is the inability to hear well in noisy environments. For that reason, most hearing aids currently marketed have a noise reduction algorithm that should make listening in noisy environments less effortful and more comfortable. Unfortunately, there are no general rules for the adjustment of noise reduction settings in hearing aids, so that clinicians have to find the best noise reduction settings for an individual listener by the method of trial and error. Available research on the perceptual effects of noise reduction concentrate on group results, not taking fully into account the possible influences of hearing loss and of differences between individuals. The aim of this research is to improve rehabilitation by optimizing noise reduction for an individual hearing aid user. To achieve this we will focus on individual preferences for the trade-off of two major aspects of noise reduction, namely the amount of residual noise and the speech distortion caused by the noise reduction algorithm. Since the preference might be influenced by hearing loss, we will specifically take into account relevant

characteristics of the individual hearing loss.*

Study objective

This study is designed to clarify how hearing ability and other individual differences influence the preference for a specific noise reduction strength. We will concentrate on the trade-off between residual noise and speech distortion * which is inherent in noise reduction * to systematically study listeners* preference.

Study design

The study is an observational study where several kinds of listening tests will be performed. All measurements take place during two visits of about 2.5 hours. Several tests will be done to characterise the hearing acuity of the subjects. Additionally, detection experiments, intelligibility tests and prefrence rating will be performed.

Study burden and risks

Since this study is observational, the burden for the patients is minimal. Several tests similar or equal to those done in clinical practice will be done during the two visits. This study forms an important step towards the goal of being able to tailor the noise reduction to the personal requirements and preferences of an individual user. Furthermore, it provides an essential base for further research into the effects of noise reduction in hearing aids.

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

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

Inclusion criteria

- Aged 18 years or older
- Native speaker of the Dutch language;- Normal hearing subjects:
o hearing thresholds of 20 dB hearing level or better for all octave frequencies between 250 and 8000 Hz
- Subjects with mild to moderate flat sensorineural hearing loss:
o hearing threshold between 40 and 60 dB hearing level at 4 kHz
o air-bone gap * 15 dB
o no more than 25 dB difference between the maximum and minimum hearing thresholds between 500 and 4000 Hz
- Subjects with mild to moderate sloping sensorineural hearing loss:
o hearing threshold between 40 and 60 dB hearing level at 4 kHz
o air-bone gap * 15 dB
o more than 25 dB difference between the maximum and minimum hearing thresholds between 500 and 4000 Hz

Exclusion criteria

-Pure tone hearing thresholds do not meet the specified criteria
-Not native speaker Dutch

Study design

Design

Study type: Observational non invasive

Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Diagnostic

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	27-11-2012
Enrollment:	50
Type:	Actual

Ethics review

Approved WMO

Date:	06-12-2011
Application type:	First submission
Review commission:	METC Amsterdam UMC

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	NL38385.018.11