Quantitative assessment of dysarthric speech in neurological disorders

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Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Movement disorders (incl parkinsonism)
Study type	Observational non invasive

Summary

ID

NL-OMON43507

Source
ToetsingOnline

Brief title
Dysarthria in neurological disorders

Condition

- Movement disorders (incl parkinsonism)

Synonym
Dysarthria, speech articulation problems

Research involving
Human

Sponsors and support

Primary sponsor: Universitair Medisch Centrum Groningen
Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: assessment, dysarthria, neurological, quantitative

Outcome measures

Primary outcome

The main study parameters are cues in speech in the categories phonation, articulation and prosody, such as articulation rate, fundamental frequency, intensity, intonation contour, phoneme production, pause length and vowel qualities.

Secondary outcome

NA

Study description

Background summary

Dysarthria is a speech motor disorder characterized by muscle weakness and poor muscle coordination. It is a neurological symptom arising from cerebral dysfunction at the level of brainstem nuclei, supra nuclear brain dysfunction or neuromuscular impairment. It occurs in neurological disorders such as Parkinson*s Disease, Amyotrophic Lateral Sclerosis, Multiple Sclerosis and Myasthenia Gravis. It can also occur after brain damage due to e.g. cerebrovascular disease. The speech patterns of dysarthric patients include constant disturbances in prosody, phonation and articulation, causing symptoms such as reduced pitch range, loudness invariation and irregular articulation rate. We hypothesize that cues in dysarthric speech can be used to automatically and remotely recognize dysarthria enabling a clinical classification. Moreover, given the association between dysarthria and dysphagia, characterizing the severity of dysarthria provides an index to assess the necessity of whether an individual may require medical intervention, particularly to prevent choking due to dysphagia.

Study objective

Our primary objective is to identify the disturbances in prosody, phonation and articulation with which dysarthria can be automatically recognized in speakers

of Dutch, and German. To this end, we will first perform an experiment that involves the ranking and sorting of validated pathological and control, previously obtained audio recordings by UMCG neurologists. Results will provide insight into which strategies are most reliably used by neurologists to classify dysarthria by type/pathology and will be used in the second, main part of this study. This will entail a multiple case study with individuals who have dysarthria as well as healthy controls. This case study, which is the core of this research, is geared towards the acquisition of phonetic, phonological, and acoustic data which can be used in refining the method with which the primary objective can be achieved.

Study design

Multiple case study. Participants will perform four speech tasks, which will be recorded with audio and video recording equipment. These tasks include: (1) a prosody task which consists of four exercises, including sentence completion, repetition and the production of negative/affirmative questions and statements; (2) a picture description task; (3) a short interview and (4) a reading task. Additional relevant information which may influence the outcome of the aforementioned tasks, will also be collected about the participant. This information includes the presence of speech and language disorders, vision or hearing problems, medication use and therapy, frequency of communication and reading, educational attainment and the last profession, all of which may have an influence on speech production. The study is a collaboration between the University Medical Center Groningen, the Netherlands (leading center), Klinikum Emden, Germany and INCAS3 in Assen, the Netherlands.

Study burden and risks

This study does not involve any risks for the participants and the burden is limited to the time invested in the study. No personal benefit to the participants is derived from this study, however, participation in this study may improve assessment of dysarthria in the future.

Contacts

Public
Universitair Medisch Centrum Groningen

Hanzeplein 1
Groningen 9713 GZ
NL
Scientific
Universitair Medisch Centrum Groningen

Hanzeplein 1
Groningen 9713 GZ
NL

Trial sites

Listed location countries

Netherlands

Eligibility criteria

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

Inclusion criteria

Patients:
- Dysarthria due to a neurological disorder
- 18 years or older
- Allowing access to medical records to verify inclusion criteria and some of the study parameters (see protocol Sections 7 and 8.2)
- Native speaker of Dutch or German
- (corrected-to) normal vision and hearing
- written informed consent
Healthy control participants:
- 18 years or older
- Native speaker of Dutch or German
- (corrected-to) normal vision and hearing
- written informed consent

Exclusion criteria

Patients:
- Cognitive problems (MMSE < 26)
- Brain damage caused by stroke that inflicted aphasia and/or apraxia of speech
- Language and/or (motor) speech disorders other than dysarthria;Healthy control participants:
- Cognitive problems (MMSE < 26)
- Brain damage

- Language and/or (motor) speech disorders

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):	16-11-2017
Enrollment:	200
Type:	Actual

Ethics review

Approved WMO

Date:	15-03-2017
Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Groningen (Groningen)

Approved WMO

Date:	28-01-2019
Application type:	Amendment
Review commission:	METC Universitair Medisch Centrum Groningen (Groningen)

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	NL55872.042.15