Postural instability and gait disability: related but separable manifestations of Parkinson's disease

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Ethische beoordeling	Positief advies
Status	Werving gestart
Type aandoening	-
Onderzoekstype	Observationeel onderzoek, zonder invasieve metingen

Samenvatting

ID

NL-OMON25618

Bron Nationaal Trial Register

Verkorte titel Postural instability versus Gait disability in PD

Aandoening

Parkinson's disease

Ondersteuning

Primaire sponsor: Donders Institute for Brain, Cognition and Behavior Centre for Cognitive Neuroimaging

Radboud University Medical Centre, Nijmegen, The Netherlands **Overige ondersteuning:** NWO Prinses Beatrix Fonds SOFPEL

Onderzoeksproduct en/of interventie

Uitkomstmaten

Primaire uitkomstmaten

The primary objective of this study is to compare the brain activity of PD patients with prominent balance or gait impairments while they mentally imagine swaying or walking respectively.

Toelichting onderzoek

Achtergrond van het onderzoek

Background of the study: Postural instability and gait disturbances are among the most incapacitating features of Parkinson's disease (PD), both for patients and their caregivers. Better pathophysiological insights are needed to provide a rational basis for improved treatment strategies. It is widely assumed that the neural substrate is identical for gait and balance problems. We propose a new pathophysiological scenario, suggesting that although gait impairment and postural instability may temporally coincide in PD, they have distinct neural substrates.

Objective of the study: The primary objective of this study is to compare the brain activity of PD patients with prominent balance or gait impairments while they mentally imagine swaying or walking respectively. A secondary objective of this study is to compare the brain activity of PD patients with balance impairments and a group of healthy subjects while they mentally imagine swaying.

Study design: We will test the hypothesis according to which gait and balance have distinct neural substrates using functional magnetic resonance imaging (fMRI) to document brain activity during task performance.

Study population: We will include 30 PD patients and 20 matched healthy volunteers. We only include patients with dopa-resistant gait and balance problems, because this represents the greatest treatment challenge in clinical practice, and because the pathophysiology underlying dopa-resistant symptoms remains unknown.

Doel van het onderzoek

This research aims at better understanding the pathophysiology of gait and balance disorders in Parkinson's disease. Specifically, we propose a radically new and contrasting viewpoint, namely that even though gait impairment and postural instability may temporally coincide in Parkinson's disease, they actually have distinct neural substrates. Proving this concept and identifying the respective neural substrates could

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potentially have great clinical and therapeutic implications. If proven to be correct, this would

imply that gait and balance difficulties would require different therapeutic approaches. Having a better understanding of the underlying cerebral substrates will also help to better understand why certain therapies have adverse effects on just gait or balance, and better inform clinicians how to avoid this.

Onderzoeksopzet

N/A

Onderzoeksproduct en/of interventie

We will test the hypothesis according to which gait and balance have distinct neural substrates using functional magnetic resonance imaging (fMRI) to document brain activity during task performance.

To avoid confounding influences of actual movements, subjects are instructed to mentally simulate the act of swaying and walking, but without actually performing it ('motor imagery'). To characterize the neural circuit underlying gait control in PD, we use a validated motor imagery protocol. To characterize the neural circuit underlying postural control, we extend this approach and apply a newly developed protocol for motor imagery of balance that closely matches the protocol used for gait. Specifically, we will use a dynamic balance task (imagining to sway on a balance board), because this is clinically more relevant than static balance. By asking subjects to alternately imagine walking or sway, we can directly contrast and isolate the neural substrates of gait and postural control. Finding differences in neural substrate between gait and balance would have great fundamental and clinical implications. First, this would imply that gait impairment and postural instability result from different pathologies in the brain. Second, this would help to create a model for designing specific therapeutic approaches that are required to combat each of these symptoms.

Contactpersonen

Publiek

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Wetenschappelijk

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Deelname eisen

Belangrijkste voorwaarden om deel te mogen nemen (Inclusiecriteria)

Parkinson's disease patients

- right-handed men/women of age > 18 years.
- written informed consent
- idiopathic PD, according to the UK Brain Bank Criteria.

• disease severity 2.5, 3 or 4 on the Hoehn & Yahr scale (gait and/or balance disorders but still able to walk/stand independently.

• gait and/or balance impairments that remain present during an optimal ON state, i.e. after a challenge with a supramaximal levodopa dosage. For this purpose, we will use criteria used previously in neurosurgery studies by our collaborators in Grenoble, and define 'gait impairment' as a UPDRS part III score ≥ 2 for the Gait item. Similarly, postural instability will be defined as a UPDRS III score ≥ 2 for the Pull test item, or a score ≥ 2 for the item 'Falls unrelated to freezing' of the UPDRS part II.

Controls

- right-handed men/women of age > 18 years
- written informed consent

Belangrijkste redenen om niet deel te kunnen nemen (Exclusiecriteria)

Parkinson disease patients

• patients with levodopa-induced gait or balance disorders (e.g., levodopa-induced freezing of gait). We will therefore exclude patients who score greater on levodopa than off levodopa on the gait, balance or freezing items of the UPDRS. • failure to lay still for 90 minutes in the scanner (for example due to head tremor or medication-induced excessive movement)

- failure to stand/walk independently
- other causes of clinically relevant gait difficulties (eg, orthopedic or vestibular disorders)
- contra-indications for MR scanning (eg, clautrophobia)
- other neurological disorders such as stroke in history or a psychiatric disease
- depression
- cognitive impairment (MMSE <26).

- severe comorbidity (eg cancer)
- pregnancy
- poor eyesight

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Onderzoeksopzet

Opzet

Туре:	Observationeel onderzoek, zonder invasieve metingen
Onderzoeksmodel:	Parallel
Toewijzing:	Niet-gerandomiseerd
Blindering:	Open / niet geblindeerd
Controle:	N.v.t. / onbekend

Deelname

Nederland	
Status:	Werving gestart
(Verwachte) startdatum:	01-10-2012
Aantal proefpersonen:	50
Туре:	Verwachte startdatum

Ethische beoordeling

Positief advies Datum: 21-01-2014

Registraties

Opgevolgd door onderstaande (mogelijk meer actuele) registratie

ID: 40055 Bron: ToetsingOnline Titel:

Andere (mogelijk minder actuele) registraties in dit register

Geen registraties gevonden.

In overige registers

Register	ID
NTR-new	NL4271
NTR-old	NTR4407
ССМО	NL41481.091.12
OMON	NL-OMON40055

Resultaten