The effects of leg power training on mobility and gait biomechanics in old adults with moderate mobility disability

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Ethische beoordeling	Positief advies
Status	Werving gestart
Type aandoening	-
Onderzoekstype	Interventie onderzoek

Samenvatting

ID

NL-OMON27358

Bron
Nationaal Trial Register

Verkorte titel
Potsdam Gait Study – POGS

Aandoening

Healthy old adults (age ≥ 65 yrs) with moderate levels of mobility disability.

Ondersteuning

Primaire sponsor: University Medical Center Groningen (UMCG)
Overige ondersteuning: University of Potsdam, Division of Training and Movement Sciences, Potsdam, Germany

Onderzoeksproduct en/of interventie

Uitkomstmaten

Primaire uitkomstmaten

Toelichting onderzoek

Achtergrond van het onderzoek

BACKGROUND: Self-selected habitual gait speed measured on a level surface is a marker and predictor of many clinical conditions, including daily function, late-life mobility, independence, mental health, survival, and mortality. Although physical therapists, geriatricians, and rehab experts routinely prescribe interventions for old adults, we do not know how, if at all, training-induced performance enhancements become incorporated into movements of activities of daily living, and in case of gait, produce longer steps and faster walking.

OBJECTIVE: Therefore, the aim of the present randomized controlled trial is to determine the effects of leg power training on mobility and gait biomechanics in old adults with moderate mobility disability.

HYPOTHESIS: We hypothesize that power training increases leg muscle power measured by dynamometry and these increased abilities become expressed in joint powers measured during gait. We expect that such favorable modifications in joint kinetics underlie the increases in step length, leading ultimately to a faster post-intervention walking speed.

STUDY DESIGN: This study is a randomized controlled trial with two arms, each crossed over, without blinding. Arm 1 completes 25-30 exercise sessions over 10 weeks, followed by a 10-week follow-up (detraining) period. Arms 2 starts with a 10-week control period to assess reliability of the tests and are then crossed over to complete 25-30 training sessions over 10 weeks.

INTERVENTION: The exercise program is designed to improve lower extremity muscle power based on ACSM guidelines.
MAIN OUTCOME MEASURES: Gait speed, muscle power, and gait biomechanics are tested at baseline, 10 weeks, and 20 weeks.

Doel van het onderzoek

Increasing age is associated with a decrease in step length, gait speed, and mobility. Gait speed predicts numerous clinical conditions, including independence and mortality. A variety of exercise interventions are highly effective in maintaining and even increasing old adults' gait speed. For example, it is routinely reported that increases in leg muscle strength are coupled with increases in habitual and maximal gait speed. Curiously, there is virtually no information about the neural and biomechanical mechanisms mediating the increases in gait speed. Therefore, the aim of the present randomized controlled trial is to determine the effects of leg power training on mobility and gait biomechanics in old adults with moderate

mobility disability. The hypothesis is that power training increases leg muscle power measured by dynamometry and these increased abilities become expressed in joint powers measured during gait. We expect that such favorable modifications in joint kinetics underlie the increases in step length, leading ultimately to a faster post-intervention walking speed.

Onderzoeksopzet

1) Baseline, 2) after 10wks of training, and 3) after 10wks of no intervention follow-up at 20 wks.

All variables are recorded at all Timepoints

Onderzoeksproduct en/of interventie

Power training consists of 30 sessions administered over 10 weeks. We use the approach of intention to treat with the minimum number of training sessions 80% (24/30) for a subject's data to be included in the analysis. The intervention focuses on improving leg power and is based on ACSM guidelines. Each session starts with 3-5 minutes of warm-up. There are two personal trainers testing and supervising subjects at all times.

Subjects will be initially tested for their three repetition maximum (3RM) measured on: 1) a seated leg press, finishing the movement with an ankle thrust and 2) knee extension (Life Fitness, Inc.) As recommended for power training by ACSM, naïve subjects perform three sets of 6-8 repetitions at 40-60% of the most recent 1RM with the intention to move the weights rapidly, explosively. The inter-repetition and inter-set rest is, respectively 10 s and 1 min. Subjects perform the following main exercises targeting leg power: seated leg press completed with an ankle thrust, knee extension, and knee flexion. Exercise progression will be based on the 3RM re-measured biweekly. Subjects can choose from a menu of supplementary exercises including trunk muscle exercises (e.g., plank).

Contactpersonen

Publiek

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Wetenschappelijk

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Deelname eisen

Belangrijkste voorwaarden om deel te mogen nemen (Inclusiecriteria)

Male, female, age ≥65, controlled blood pressure, self-selected gait speed < 1.2 m/s.

Belangrijkste redenen om niet deel te kunnen nemen (Exclusiecriteria)

BMI ≥ 30, unable to walk 10 m independently, joint replacements in leg less than 6 months before enrollment, uncontrolled CVD or angina, neuromuscular disease, diagnosed Parkinson’s disease, Multiple Sclerosis, or stroke, cancer therapy less than 3 months before enrollment, severe asthma or chronic bronchitis, diagnosed diabetes with neuropathy, poor and uncontrolled eyesight

Onderzoeksopzet

Opzet

Type:	Interventie onderzoek
Onderzoeksmodel:	Cross-over
Toewijzing:	Gerandomiseerd
Blindering:	Open / niet geblindeerd
Controle:	Actieve controle groep

Deelname

Nederland

Status:	Werving gestart
(Verwachte) startdatum:	01-02-2015
Aantal proefpersonen:	30
Type:	Verwachte startdatum

Ethische beoordeling

Positief advies

Datum:	17-04-2015
Soort:	Eerste indiening

Registraties

Opgevolgd door onderstaande (mogelijk meer actuele) registratie

Geen registraties gevonden.

Andere (mogelijk minder actuele) registraties in dit register

Geen registraties gevonden.

In overige registers

Register	ID
NTR-new	NL4880
NTR-old	NTR5151
Ander register	Potsdam University Research Ethics Committee : Ethical Review No. 40/2014

Resultaten