Differences in walking biomechanics and energetics between self-paced and fixed speed treadmill walking

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Self-paced treadmill walking increases the energetic cost of walking and is related to the variability of biomechanical and spatiotemporal parameters and muscle activation patterns.

Ethische beoordeling	Niet van toepassing
Status	Werving gestart
Type aandoening	-
Onderzoekstype	Observationeel onderzoek, zonder invasieve metingen

Samenvatting

ID

NL-OMON21622

Bron
NTR

Verkorte titel
SF

Aandoening

Healthy young adults

Ondersteuning

Primaire sponsor: Maastricht University
Overige ondersteuning: Maastricht University

Onderzoeksproduct en/of interventie

Uitkomstmaten

Primaire uitkomstmaten

Energetic cost of walking (mlO2/kg/m)

Toelichting onderzoek

Achtergrond van het onderzoek

Walking is often named in patient populations as one of the most important motor functions for maintaining a good quality of life. The increased use of treadmill walking in movement laboratories allows for continuous recording of walking characteristics and it is less exhausting for the patient by eliminating repeated back and forth walking as in an overground movement laboratory. Thanks to a self-regulating speed on the treadmill, the natural walking speed variation as seen in daily life is maintained. Previous research has shown that an oscillating position on a fixed-speed treadmill increases energy costs. However, it is not yet known whether the self-regulating speed, at which the person controls the speed of the treadmill, also increases the energy cost of walking compared to a fixed speed. By walking at different speeds, the parabolic relationship between the energy cost and the speed of walking can be simulated in both conditions. The lowest energy cost per distance travelled corresponds to the optimal (comfortable) walking speed. In addition to the energy cost measured via respiratory gas analysis, muscle power efficiency also contributes to the energy cost. In combination with joint angles, forces and moments (clustered as walking biomechanics), differences between the self-regulating and fixed speed can be explained. By validating the energy cost of walking and certain walking characteristics with the measured values by means of accelerometry, a translation can be made to the energy consumption of walking in daily life.

Doel van het onderzoek

Self-paced treadmill walking increases the energetic cost of walking and is related to the variability of biomechanical and spatiotemporal parameters and muscle activation patterns.

Onderzoeksopzet

Non-WMO approved

Contactpersonen

Publiek

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Wetenschappelijk

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Deelname eisen

Belangrijkste voorwaarden om deel te mogen nemen (Inclusiecriteria)

- Healthy persons aged 18-35 years
- Able to walk for 40 minutes in a row
- Body Mass Index (BMI) < 30

Belangrijkste redenen om niet deel te kunnen nemen (Exclusiecriteria)

- Not comfortable with walking on a treadmill.
- Presence of cardiovascular or musculoskeletal diseases or injuries affecting gait

Onderzoeksopzet

Opzet

Type:	Observationeel onderzoek, zonder invasieve metingen
Onderzoeksmodel:	Anders
Toewijzing:	N.v.t. / één studie arm
Blindering:	Open / niet geblindeerd
Controle:	N.v.t. / onbekend

Deelname

Nederland

Status:	Werving gestart

(Verwachte) startdatum:	01-05-2019
Aantal proefpersonen:	18
Type:	Verwachte startdatum

Voornemen beschikbaar stellen Individuele Patiënten Data (IPD)

Wordt de data na het onderzoek gedeeld: Nog niet bepaald

Ethische beoordeling

Niet van toepassing

Soort:	Niet van toepassing

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	NL8160
Ander register	METC azM/UM : 2019-1128

Resultaten