

Orientation of lower limb joint-axes during gait in children with cerebral palsy

Gepubliceerd: 05-01-2021 Laatste bijgewerkt: 13-12-2022

It is hypothesized that the orientation of the lower limb joints are not parallel to the walking direction and that a standing measure is highly correlated with the orientation during the standing, load bearing, phase of the gait cycle.

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

Samenvatting

ID

NL-OMON21545

Bron

NTR

Verkorte titel

Orientation of lower limb joint-axes during gait in children with cerebral palsy

Aandoening

Cerebral Palsy

Ondersteuning

Primaire sponsor: Sint Maartenskliniek

Overige ondersteuning: Interreg (2 Seas Mers Zeeën)

Onderzoeksproduct en/of interventie

Uitkomstmaten

Primaire uitkomstmaten

The primary objective of this research is to identify the orientation of the ankle, knee and hip joint axes of rotation (flexion-extension) with respect to the walking direction during gait and standing in children with CP. The orientation of the lower limb joint axes during stance phase of the gait cycle and the orientation during stance will be compared using a Pearson correlation and Bland-Altman analysis.

Toelichting onderzoek

Achtergrond van het onderzoek

Rationale: One of the most common disabilities in childhood is Cerebral Palsy (CP). Musculoskeletal problems such as spasticity and joint deformities are frequently seen within CP patients. As a consequence, joint movement axes are rotated relative to each other in the transverse plane. The malalignment of rotation axes leads to deviated gait patterns and limited self-mobility in approximately 50% of the children with CP.

Robotic devices can provide gait training with intensive, controlled, repetitive, and goal-oriented movements with promising results for adults and children. Within the current robotic devices, the axes of rotation for flexion around the ankle, knee and hip are nearly perfectly parallel aligned in the transversal plane. Therefore, they are not optimal for children with CP with joint deformities. A possible solution could be adjustable axes of rotations within the design of the robotic devices. In order to define the minimally needed ranges for adaptable axes of rotation, it is important to determine the orientation of the lower limb joint axes with respect to the walking direction in children with CP with joint deformities.

Objective: The primary objective of this research is to identify the orientation of the ankle, knee and hip joint axes of rotation (flexion-extension) with respect to the walking direction during gait and standing in children with CP. The secondary objective is to determine the correlation between the orientation of the these joint axes during gait and standing in children with CP. In addition, we will determine the correlation between the tibia and femoral torsion as measured during the clinical examination, the femoral anteversion angle from x-ray and the orientation of the axes during gait.

Study design: Retrospective cross-sectional study.

Study population: CP patients, Gross Motor Function Classification System (GMFCS) level II-IV, 8 - 12 years old at time of 3D Gait Analysis (3DGA).

Intervention: not applicable.

Main study parameters/endpoints: The main study parameter is the mean and variation of the orientation the lower limb joint axes with respect to the walking direction during gait (during the stance and swing phase separately) and standing from 3DGA.

Nature and extent of the burden and risks associated with participation, benefit and group relatedness: Patients have already had the 3DGA and all clinical tests for clinical purposes. Participating in the study does not involve any procedures. Therefore, no risks are identified and no burden is associated with participation. Patients do not directly benefit from participating but participation does increase knowledge about the orientation of the lower limb joint axes with respect to the walking direction in children with CP with joint deformities.

Doel van het onderzoek

It is hypothesized that the orientation of the lower limb joints are not parallel to the walking direction and that a standing measure is highly correlated with the orientation during the standing, load bearing, phase of the gait cycle.

Onderzoeksopzet

Retrospective data analysis; no time points.

Contactpersonen

Publiek

Sint Maartenskliniek
Carmen Ensink

024-365 9140

Wetenschappelijk

Sint Maartenskliniek
Carmen Ensink

024-365 9140

Deelname eisen

Belangrijkste voorwaarden om deel te mogen nemen (Inclusiecriteria)

- Diagnosed with CP, Gross Motor Function Classification System (GMFCS) level II-IV
- Age 8-12 years at the time of performing the 3DGA
- Available 3DGA, with signed informed consent to use the data for research purposes
- Available clinical examination (tibial torsion, femoral torsion, femoral anteversion angle)

Belangrijkste redenen om niet deel te kunnen nemen

(Exclusiecriteria)

- Use of a stance correcting walking aid (for example ankle foot orthosis or orthopedic shoes) during 3DGA

Onderzoeksopzet

Opzet

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

Deelname

Nederland	
Status:	Werving gestart
(Verwachte) startdatum:	01-01-2021
Aantal proefpersonen:	30
Type:	Verwachte startdatum

Voornemen beschikbaar stellen Individuele Patiënten Data (IPD)

Wordt de data na het onderzoek gedeeld: Nog niet bepaald

Ethische beoordeling

Positief advies	
Datum:	05-01-2021
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	NL9170
Ander register	CMO regio Arnhem-Nijmegen : 2020-6561

Resultaten