Postural control during the development of walking in infancy

Published: 13-03-2015 Last updated: 21-04-2024

To longitudinally study the changes in postural control in typically developing infants during the emergence of the ability to walk independently by means of simultaneous recording of multiple surface electromyography*s and kinematics.

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Congenital and peripartum neurological conditions
Study type	Observational non invasive

Summary

ID

NL-OMON41830

Source ToetsingOnline

Brief title Postural control during learning to walk

Condition

• Congenital and peripartum neurological conditions

Synonym

we study typical development as a prerequisite for understanding of atypical development

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: EMG, Infants, Postural control, Walking

Outcome measures

Primary outcome

Direction-specificity at neck, trunk and leg level.

Secondary outcome

Secondary muscle parameters: patterns of muscle activation, recruitment order,

latencies, anticipatory activation. Secondary kinematic parameters: head

stability, joint angle changes, kinematic parameters of reaching movements such

as movement units and reaching duration.

Study description

Background summary

Adequate postural control is required for the maintenance of balance in many daily life activities, such as sitting, reaching, standing and walking. Results of a former study suggested that postural control in terms of direction-specificity (the first level of postural control; it means that during forward body sway, the dorsal muscles are activated primarily) did not change during the development of independent sitting. As the ultimate goal of human postural control might be aimed towards standing and walking, direction-specificity might rather be related to the ability to walk independently. Literature indeed suggests that that early walking behaviour may be associated with changes in postural control. However no study longitudinally assessed the changes in postural control during the emergence of the ability to walk independently.

Study objective

To longitudinally study the changes in postural control in typically developing infants during the emergence of the ability to walk independently by means of simultaneous recording of multiple surface electromyography*s and kinematics.

Study design

Small observational cohort study.

The infants will be assessed three times: i.e. when the infant is at the verge of being able to walk independently, when the infant is just able to walk independently and when the infant has mastered walking ability for a month. During each assessment postural control will be assessed by means of surface EMGs of neck-, trunk-, leg- and armmuscles and kinematics during reaching and grasping (we have already substantial knowledge on postural control during this activity) and during gait initiation (paucity of knowledge).

Study burden and risks

The infants will be assessed three times. The assessments will take place at the infant*s home or at the UMCG. Surface EMG electrodes and small markers will be attached to the skin of the infant. Previous studies indicated that infants tolerate these small devices well. If the child gets tired, hungry, or starts to cry the assessment is stopped. If the infant is already in a non-optimal behavioural state in the phase of electrode mounting, the assessment is also stopped. It is discussed with the parents whether it is possible to restart at a later point in time. Parents will fill out a short questionnaire on prenatal, perinatal and neonatal history (10 minutes). There are no risks associated with participation. The benefit of the study in general consists of novel information on postural control during the development of the ability to walk independently. This information can only be obtained by studying infants. Benefits of participation for infant and family consist of getting detailed information on the child*s current developmental status.

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 Children (2-11 years)

Inclusion criteria

Healthy full-term infants, i.e. infants born after a gestational age of at least 37 weeks without prenatal, perinatal or neonatal complications.

At the verge of being able to stand independently. This is defined as being able to stand with the help of support, e.g., furniture, but not being able to stand independently. Parents or legal representatives will provide written informed consent Parents

Exclusion criteria

Admission to the paediatric department of a hospital Severe congenital abnormalities, such as serious congenital heart disorders or a chromosomal condition Birth weight below the tenth percentile Neurological abnormalities Parents have insufficient understanding of the Dutch language.

Study design

Design

Study type: Observational non invasiveMasking:Open (masking not used)Control:Uncontrolled

Other

Primary purpose:

4 - Postural control during the development of walking in infancy 14-05-2025

Recruitment

NL	
Recruitment status:	Recruitment stopped
Start date (anticipated):	26-03-2015
Enrollment:	26
Туре:	Actual

Ethics review

Approved WMO	
Date:	13-03-2015
Application type:	First submission
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 CCMO ID NL51701.042.14