Measurement of upper extremity function in persons with neuromuscular diseases (NMD)

Published: 14-03-2012
Last updated: 01-05-2024

Obtain information regarding the movement abilities and muscle strength in persons with several neuromuscular diseases, which can be used to develop a motion controlles arm suport for daily use and training of arm function.

Ethical review	Approved WMO
Status	Pending
Health condition type	Neurological disorders congenital
Study type	Observational non invasive

Summary

ID

NL-OMON39775

Source
ToetsingOnline

Brief title
Upper extremity function in NMD

Condition

- Neurological disorders congenital
- Muscle disorders

Synonym
muscular dystrophy, neuromuscular diseases

Research involving
Human

Sponsors and support

Primary sponsor: Universitair Medisch Centrum Sint Radboud
Source(s) of monetary or material Support: Ministerie van OC&W,Pieken in de Delta

(ministerie) en Provincie Brabant

Intervention

Keyword: movement analysis, neuromuscular diseases, upper extermity

Outcome measures

Primary outcome

Registration of single movements:

Shoulder abduction (straight arm), shoulder anteflexion (straight arm)

shoulder abduction (elbow flexed 90)

shoulder anteflexion (elbow flexed 90) shoulder internal rotation, shoulder

adduction in horizontal plane (Only with arm support)

Movement Registration of functional movements:

Bringing the hand to the mouth (active flexion and supination of the arm and

passive pronation)

Reaching to the left and right (active protraction of the scapula)

Pulling and pushing a light object on a table

EMG measures:

m. biceps brachii

- m. lateral deltoid

- m. triceps brachii

- m. trapezius descendens

- m. pectoralis major

Maximum Voluntary Contraction

- m. biceps brachii

- m. lateral deltoid

- m. triceps brachii

- m. trapezius descendens

- m. pectoralis major

Secondary outcome

fatigue (Numeric Rating Scale)

pain (Numeric Rating Scale) and location

Study description

Background summary

For the development of an empowered motion controlled arm support which can assist in daily life and can be used for training, it is important to
- Assess limitations of the potential users
- Evaluate wishes and needs of potential users.

Previously the limitations and restrictions in daily activities have been investigated with use of questionnaires (Title: Questionnaire regarding the functioning of arms and hands-on disorder. Activity and participation level in boys with Duchenne muscular dystrophy: CMO No.: 20081341)

UMC St Radboud and Maastricht University have laboratories in which human movements can be analysed with VICON system and muscle activity can be recorded with EMG.

Previously , we conducted a pilot for a draft protocol for motion analysis testing. Title: Developing a measurement protocol for Upper Extremity Function (UEF) in boys with Duchenne muscular dystrophy (DMD) (UEF study): CMO Registration number: 2010/205
No ABR: NL32552.091.10

The present study is a continuation of these previous studies. The present study uses an improved measurement protocol and is used for different potential

users. In addition to participants with Duchenne muscular dystrophy, the limitations in arm function are evaluated in subjects with facioscapulohumeral muscular dystrophy and limb girdle dystrophy.

Study objective

Obtain information regarding the movement abilities and muscle strength in persons with several neuromuscular diseases, which can be used to develop a motion controlles arm suport for daily use and training of arm function.

Study design

Observational explorative research according protocol:
registration of singular movements, functional movements and EMG registration of the activities as a percentage of EMG of maximum voluntary contraction.

Study burden and risks

Due to the limited strength and possible poor overall physical condition of the participants, participation can physically tiring.
The researchers are trained to indicate and ask for signs of fatigue and overload and will implement breaks and finish the measurements if needed. The burden is acceptable according to the researchers and the riscs are minimized as shown in previous research.

Contacts

Public
Universitair Medisch Centrum Sint Radboud

Reinier Postlaan 2
Nijmegen 6584 CG
NL
Scientific
Universitair Medisch Centrum Sint Radboud

Reinier Postlaan 2
Nijmegen 6584 CG
NL

Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adolescents (12-15 years)
Adolescents (16-17 years)
Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

6 healthy control subjects
5-10 persons with confirmed diagnosis of spinal muscular atrophy
6 persons with confirmed diagnosis of fascioscapulohumeral dystrophy
6 persons with confirmed dignosis of limb girdle muscular dystrophy
All persons with a neuromuscular disease have impaired function of the upper extremity with a score on the Brooke scale of 3 or 4.
All persons are able to sit in a (wheel)chair with a low back rest

Exclusion criteria

Other diseases impairing arm function
inability to come to the movement analysis laboratory
inability to cooperate

Study design

Design

Study type: Observational non invasive

Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Diagnostic

Recruitment

NL

Recruitment status:	Pending
Start date (anticipated):	01-01-2012
Enrollment:	24
Type:	Anticipated

Ethics review

Approved WMO Date:	14-03-2012
Application type:	First submission
Review commission:	CMO regio Arnhem-Nijmegen (Nijmegen)
Approved WMO Date:	21-02-2014
Application type:	Amendment
Review commission:	CMO regio Arnhem-Nijmegen (Nijmegen)

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	ID
CCMO	NL39024.091.11