Muscle endurance of the upper and lower extremity.

Gepubliceerd: 29-06-2010 Laatst bijgewerkt: 18-08-2022

1. Examine the reproducibility of the non-volitional endurance test in healthy subjects. The hypothesis is that the non-volitional endurance test is reproducible; 2. Comparison of muscle endurance tested at three different stimulation intensities....

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

Samenvatting

ID

NL-OMON22314

Bron
NTR

Aandoening

Muscle endurance of the biceps and quadriceps in healthy subjects

Ondersteuning

Primaire sponsor: NUTRIM School for Nutrition, Toxicology and Metabolism
Maastricht University Medical Centre+ (MUMC+)
Overige ondersteuning: NUTRIM School for Nutrition, Toxicology and Metabolism
Maastricht University Medical Centre+ (MUMC+)

Onderzoeksproduct en/of interventie

Uitkomstmaten

Primaire uitkomstmaten

1. Quadriceps muscle endurance: Tlim (number of contractions until 20, 30 and 40% torque decline), Steady state (% peak torque), transition point of the force decline curve (s);
2. Biceps muscle endurance: Tlim (number of contractions until 20, 30 and 40% torque

decline), Steady state (% peak torque), transition point of the force decline curve (s).

Toelichting onderzoek

Achtergrond van het onderzoek

Rationale:

Muscle dysfunction is commonly observed in patients with chronic obstructive pulmonary disease (COPD). It is unclear whether the muscle dysfunction is generalized or if it mainly affects the lower extremities. At present, a wide range of test models and protocols is being used for quantification of muscle endurance in COPD patients. These can be divided on basis of muscle activation strategy, involving voluntary effort or exogenous stimulation. Since the main complaints in COPD are dyspnea and fatigue, it can be expected that COPD patients are not fully motivated to perform an endurance test. Consequently, tests involving maximal voluntary contractions (MVC's) are likely to obtain sub-maximal test results when used in COPD patients. Limitations of voluntary manoeuvres are overcome by non-volitional muscle activation. Stimulation of motor endplates is effort-independent and seems feasible in quantifying arm and leg muscle endurance in COPD patients. Before using electrical stimulation extensively in a clinical population (such as COPD) to test muscle endurance in the lower and upper limbs, the reproducibility of the test needs to be examined in healthy subjects.

Objectives:

1. Examine the reproducibility of the non-volitional endurance test in healthy subjects. The hypothesis is that the non-volitional endurance test is reproducible;

2. Comparison of muscle endurance tested at three different stimulation intensities. It is hypothesised that there is no effect of stimulation intensity;

3. Comparing endurance between the arm and leg muscle in healthy subjects. It is expected that arm muscle endurance is lower than leg muscle endurance.

Study design:

Reproducibility study. The total duration of the experiment for the healthy subjects will be 225 minutes, divided over five visits. During the first visit, subjects will be asked to perform three maximal voluntary contractions with their biceps brachii and quadriceps femoris on a dynamometer. During the next four visits, the subjects will perform leg and arm endurance

tests with use of muscle stimulation. These tests will be implemented on three different intensities and the last test will be repeated at the highest of the three intensities. The electrical stimuli (300s: 2s on 2s off, 30Hz) will be delivered trough two rubber electrodes on the motor end plates of the biceps brachii and of the quadriceps femoris.

Study population:

16 healthy subjects.

Main study parameters/endpoints:

Muscle endurance: TLIM (number of contractions until 20, 30 and 40% torque decline), steady state (% peak torque), transition point of the force decline curve (s) of the elbow flexors and knee extensors.

Doel van het onderzoek

1. Examine the reproducibility of the non-volitional endurance test in healthy subjects. The hypothesis is that the non-volitional endurance test is reproducible;

2. Comparison of muscle endurance tested at three different stimulation intensities. It is hypothesised that there is no effect of stimulation intensity;

3. Comparing endurance between the arm and leg muscle in healthy subjects. It is expected that arm muscle endurance is lower than leg muscle endurance.

Onderzoeksopzet

Endurance tests will take place on separate days, to prevent for muscle fatigue at the start of the endurance test. During the first visit, subjects will be familiarized with all equipment and testing procedures and perform a leg and arm maximal strength test. During the next three visits, the subjects will perform three leg and three arm endurance tests, on three different stimulation intensities.

Onderzoeksproduct en/of interventie

Measurement of quadriceps and biceps muscle endurance using electrical muscle stimulation.

Contactpersonen

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Wetenschappelijk

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Deelname eisen

Belangrijkste voorwaarden om deel te mogen nemen (Inclusiecriteria)

1. Healthy subjects: no neuromuscular disorders, no joint disorders, no metal implants, no pacemaker;

2. Age: 21-30 years, to exclude age-effects;

3. Eight men, eight women;

4. Different physical activity levels (five sportsmen, six semi-sportsmen, five non-sportsmen);

5. Volunteers willing to participate;

6. Fully competent.

Belangrijkste redenen om niet deel te kunnen nemen (Exclusiecriteria)

1. Neuromuscular disorders. Neuromuscular disorders can affect the conduction speed;

2. Known joint disorders in the hip, leg and/or knee. Theses disorders can cause confounding in the measurements;

3. Metal implants in hip, leg or knee. Metal implants can cause a disturbance in the electrical field, causing overheating and burn of the tissues surrounding the metal;

4. Cardial pacemaker or Internal Cardiac Defibrillator (ICD);

5. Lack of motivation to participate in this study.

Onderzoeksopzet

Opzet

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

Deelname

Nederland

Status:	Werving nog niet gestart
(Verwachte) startdatum:	01-08-2010
Aantal proefpersonen:	16
Type:	Verwachte startdatum

Ethische beoordeling

Positief advies

Datum:	29-06-2010
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	NL2270
NTR-old	NTR2396
Ander register	ABR : 32277
ISRCTN	ISRCTN wordt niet meer aangevraagd.

Resultaten

Samenvatting resultaten
N/A