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The effects of patterned electrical stimulation on the temporal pattern of EMG activity in biceps and triceps during a reaching/retrieval task after stroke

Submission date
30/09/2005

Recruitment status
No longer recruiting

Registration date
30/09/2005

Overall study status
Completed

Last Edited
18/10/2017

Condition category
Circulatory System

[_] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[_] Results
[_] Individual participant data
[_] Record updated in last year

Plain English summary of protocol
Not provided at time of registration

Contact information

Type(s)
Scientific

Contact name
Miss Imogen Carter

Contact details
St Georges Hospital Medical School
Centre for Rehabilitation and Ageing
St Georges Hospital Medical School
Cranmer Terrace
London
United Kingdom
SW17 0RE

Additional identifiers

Protocol serial number
N0236143735

Study information

Scientific Title
The effects of patterned electrical stimulation on the temporal pattern of EMG activity in biceps and triceps during a reaching/retrieval task after stroke

Study objectives
The aims of the project are to assess what effects electrically stimulating weakened triceps in stroke subjects has on a task that includes elements of reach and retrieval compared to not stimulating triceps for the same task. In particular I will be assessing whether electrical stimulation changes the ability of the subject to turn a cranked wheel and will record how smoothly they turn the wheel pre and post intervention (electrical stimulation). Further aims are first, to assess whether stimulating triceps has any effect on peak triceps muscle activity after stimulation, second, to see whether electrically stimulating triceps has any effect on the spatial and temporal parameters and modulation of biceps and triceps EMG activity after stimulation.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Not provided at time of registration

Study design
Randomised controlled trial

Primary study design
Interventional

Study type(s)
Not Specified

Health condition(s) or problem(s) studied
Cardiovascular: Stroke

Interventions
Overview of planned research and summary of methods used: The research will involve a screening/assessment phase followed by the testing phase and will require subjects to attend the rehabilitation research laboratory at St. George's hospital for one session only. The methods used will be a randomised pre-test - post-test one group design that will involve a small sample of stroke subjects, 12 in each group.

The concerned communities have not been consulted over the design and details of this research as it is a preliminary study looking at proof of principle for electrical stimulation in the upper limb.

At least 24 stroke patients with upper limb difficulties will be recruited. The stroke subjects will be recruited from outpatient neuro-physiotherapy department at St. George's hospital, and the orthotics clinic at the Wolfson Neuro-Rehabilitation Unit. Subjects will also be recruited via advertisement on boards within St. George's and advert in the local paper.

The lead applicant will inform the physiotherapists at the neuro-outpatient services, at St. George's Hospital and the orthotics clinic, Wolfson Neuro-Rehabilitation Unit about the purpose of the study, and the study criteria physiotherapy discharge reports will then be reviewed to

identify any recently discharged patients and clinics ready for discharge who meet the study criteria. The lead applicant will then contact each potential subject. If potential subjects are still attending outpatient physiotherapy clinics then the first contact will be face to face during one of their visits to St. George's NHS Trust. If potential subjects are no longer attending outpatient physiotherapy clinics then the lead applicant will make the first contact by sending information about the study, and informed consent form and a sae. Along with a covering letter explaining how they had been identified. The covering letter will state that the lead applicant will be telephoning them within a week of the date of the letter to discuss any questions they might have about the study before they consider giving written informed consent. The covering letter will also state that the lead researcher will be pleased to answer any questions that they might have about the study and welcomes telephone calls at any time.

Once written informed consent is provided then subjects will be recruited to the study and given an appointment to attend the Rehabilitation Research Laboratory at St.George's.

On their arrival at the Rehabilitation Research Laboratory the subjects will be asked to put on a sleeveless T-shirt (this will be supplied if the subjects do not have one of their own). The contextual Assessment will then be undertaken. It is anticipated that this will take approximately 15 minutes. If the subjects meet the criteria at this point they will be invited to continue the research.

The next stage will include taking measurements of their ability to turn the wheel. This will be split into a baseline, intervention and outcome. Their ability to turn the wheel and EMG activity will be assessed during the both phases A and C. the electrical stimulation will be applied during the intervention phase B.

Intervention Type
Other

Phase
Not Specified

Primary outcome(s)
1. Magnitude of peak EMG activity in paretic triceps muscle
2. The number of the position bin for peak EMG activity in paretic triceps muscle
3. The temporal-spatial pattern of onset/offset of EMG activity in paretic triceps muscle throughout wheel turning
4. The modulation of biceps/triceps

Key secondary outcome(s))
Not provided at time of registration

Completion date
30/09/2005

Eligibility

Key inclusion criteria

At least 24 stroke patients with upper limb difficulties will be recruited. The stroke subjects will be recruited from the neuro-outpatient physiotherapy department at St. George's hospital, and the orthotics clinic at the Wolfson Neuro-Rehabilitation Unit. They will also be identified on the stroke database.

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Not Specified

Sex
Not Specified

Key exclusion criteria
1. Receiving physiotherapy for the upper limb whilst involved in this study - as this may influence the results
2. More than 150 degrees flexion contracture of the paretic elbow joint - as this would restrict their ability to turn the wheel
3. Any other neuromusculoskeletal pathology severe enough to contribute to the paretic upper limb impairment and/or disability - as this would influence results
4. Unstable medical condition - subjects should medically stable to participate
5. Any contraindications to electrical stimulation i.e. pacemaker in situ (Chen et al; 1990), heart arrhymias, pregnancy, superficial metal implants in the upper limb, cancerous tumour, broken or fragile skin in the areas where electrodes need to be placed (Baker et al. 1979a) known tape allergies, uncontrolled epilepsy - this will rule out any potential adverse affects

Date of first enrolment
21/06/2004

Date of final enrolment
30/09/2005

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
St Georges Hospital Medical School
London
United Kingdom
SW17 0RE

Sponsor information

Organisation
Department of Health

Funder(s)

Funder type
Government

Funder Name
St George's Healthcare NHS Trust (UK), NHS R&D Support Funding

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not provided at time of registration

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes