



A pilot study to inform sample-size calculations for an investigation into the effects of Electrical Stimulation on recovery of hand sensation and function in stroke patients

Mann G.E.,¹ Burridge J.H.,² Malone L.¹ Taylor P.N.¹

¹Department of Medical Physics and Biomedical Engineering, Salisbury District Hospital,
Salisbury,
Wiltshire, SP28BJ, UK

²Department of Rehabilitation and Health Sciences, University of Southampton,
Southampton, SO17 1BJ, UK

Background and Purpose

Recovery of motor function, rather than associated sensory deficits is the main focus of rehabilitation therapy for the upper limb following stroke in the United Kingdom. Sensory deficits are known to have an adverse effect on functional outcome, although their severity is not necessarily related to degree of functional loss. Studies that have included assessment of sensation have proved inconclusive. A retrospective study of stroke patients with restricted hand function and sensation, referred to the authors for electrical stimulation treatment, showed improvement in sensation in the hemiplegic hand in seven out of eleven patients tested measured using static 2 point discrimination of 24 areas of the hand. It is recognised that this previous study had design and methodological limitations. The purpose of this study is to inform sample-size calculations for a full randomised controlled trial to investigate the effects of electrical stimulation on recovery of hand sensation and function in stroke patients.

Methods

30 subjects, within one year following a first stroke, are randomised into equal treatment and control groups. The treatment group receives electrical stimulation of elbow and wrist extensors and the control group, elbow and wrist extension exercises. Assessments of upper limb function use the Action Research Arm Test and the Jebsen Taylor Hand Function Test. Hand sensation is assessed using Static Two Point Discrimination. Assessments are conducted pre treatment (week 0) mid treatment (week 6) and post treatment (week 12) and 12 weeks post treatment (week 24).

Results

15 subjects (9 female, 6 male) have so far been recruited to the study, (mean age) between 2 months and 1 year after stroke. Of these one has completed the study and six others have completed the treatment period only. Further results will be presented.

Ref.Taylor PN, Burridge JH, Hagan SA, Swain IDS. (1995) Electrical stimulation exercises to improve hand function and sensation following chronic stroke. Pro. 5th Vienna International Workshop on Functional Electrostimulation ISBN 3-900928-03-7 pp359-362



Address for correspondence: Geraldine Mann, Dept. Medical Physics & Biomedical Engineering, Salisbury District Hospital, Salisbury, Wiltshire SP2 8BJ. E-mail g.mann@mpbe-sdh.demon.co.uk .

Mann GE, Malone LJ, Taylor PN, Burrige JH. A pilot study to inform sample size calculations for an investigation into the effects of electrical stimulation on recovery of hand sensation and function in stroke patients. *2nd Bournemouth University Academic Biomedical Engineering Research Group meeting*, (ISBN 1-85899-156-0), Salisbury, UK, September 2001.