



The combined effect of Dynamic splinting and Neuromuscular electrical stimulation in reducing wrist and elbow contractures in six children with Cerebral palsy

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Abstract

The aim of this pilot study was to investigate the feasibility of applying the combination of Dynamic splinting (DS) and Neuromuscular electrical stimulation (NMES) in order to improve wrist and elbow function, and range of motion, in children with upper limb contractures due to Cerebral palsy (CP). Six children aged seven to 16, with contractures at the wrist or elbow, were recruited. Following a 12-week baseline period all participants underwent a 12-week treatment period where DS was used for one hour per day and combined with NMES for the second half of the 1-h treatment. A 12-week follow-up period then ensued. Upper limb function was assessed with the Melbourne assessment, physical disability with the Paediatric Evaluation of Disability Index and the Activity Scale for Kids, and quality of life with the Pediatric Quality of Life Scale. Passive and active range of motion at the wrist and elbow were measured using manual and electrical goniometers. The technique of using combined NMES and DS was demonstrated to be feasible and compliance with the intervention was good. There was an increase in passive elbow extension in two participants treated for elbow contractures, although no accompanying change in upper limb function was demonstrated. Wrist range of movement improved in one participant treated for wrist contracture.

Keywords: Upper limb orthotics, neuromuscular electrical stimulation, dynamic splinting, cerebral palsy