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A case study to determine the effect of an activity-based neuromuscular electrical stimulation (NMES) programme in acute stroke survivors

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ABSTRACT

Stroke survivors in South Africa are often discharged from inpatient care before they have reached functional independence. Due to the distance to healthcare facilities and the high costs associated with travelling, they are often unable to access outpatient rehabilitation. Neuromuscular electrical stimulation (NMES) is one of the adjunctive treatment modalities available to facilitate improvement in motor function and participation in activities of daily living post stroke in the acute inpatient phase of treatment. However, research has yielded contradictory results in relation to the use of NMES in stroke cases. This study investigated the change in motor function and participation in activities of daily living of an activity-based NMES programme in the short inpatient admission period for first incident stroke survivors. The effect of dominance, age and cognition on the improvement found after an activity based NMES programme was described.

A case study research design was used with three stroke survivors who complied with the inclusion and exclusion criteria associated with the application of NMES after stroke. A NMES programme of two 30-minute sessions was administered in addition to a routine occupational therapy programme for a duration of five days.

The participants achieved a significant statistical improvement in overall motor function as assessed by the Fugl-Meyer assessment (FMA) ($p=0.002$). Scores on all subtests of the FMA improved significantly for two participants, except for the coordination subtest. Improvement in personal activities of daily living assessed on the Modified Barthel Index (MBI) also showed statistical improvement ($p=<0.001$). The greatest improvement was found for toilet transfer, personal hygiene and washing. Scores on the FMA and MBI indicated that initial deficits or severity of the stroke determine outcomes rather than age and or dominance. Participants with better cognitive function who had higher scores on the Mini Mental-State Examination (MMSE) had better outcomes after the intervention.

The use of an activity-based NMES programme during the short inpatient admission with selected stroke survivors in the South African context has a positive outcome in facilitating upper limb motor function and personal activities of daily living. The significant improvement in these components found in this study reduced the participants' dependence on caregivers at discharge. Home programmes to facilitate further improvement were recommended for all participants.