GIVING THEM A HAND: WEARING A MYOELECTRIC ELBOW-WRIST-HAND ORTHOSIS REDUCES UPPER EXTREMITY IMPAIRMENT IN CHRONIC STROKE

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OBJECTIVE

To determine the effect of a portable, myoelectric elbow-wrist-hand orthosis (MEWHO) on paretic upper extremity (UE) impairment in chronic, stable, moderately impaired stroke survivors.

DESIGN

Observational cohort study.

SETTING

Outpatient rehabilitation clinic.

PARTICIPANTS

Stroke survivors exhibiting chronic, moderate, UE hemiparesis (N=18).

INTERVENTIONS

Subjects were administered a battery of outcome measures testing UE impairment, functional performance and gross manual dexterity. They then donned a fabricated MEWHO and were again tested on the same battery of measures while wearing the device.

MAIN OUTCOME MEASURES

Outcome measures included the UE section of the Fugl-Meyer Impairment Scale (UEFM), a battery of functional tasks and the Box and Block (BB) test.

RESULTS

Subjects exhibited significantly reduced UE impairment while wearing the MEWHO (FM: $t=8.56$, $P<.0001$) and increased quality in performing all functional tasks while wearing the MEWHO, with 3 subtasks showing significant increases (feeding [grasp]: $z=2.251$, $P=.024$; feeding [elbow]: $z=2.966$, $P=.003$; drinking [grasp]: $z=3.187$, $P=.001$). Additionally, subjects showed significant decreases in time taken to grasp a cup ($z=1.286$, $P=.016$) and increased gross manual dexterity while wearing a MEWHO (BB test: $z=3.42$, $P<.001$).

CONCLUSIONS

Results suggest that UE impairment is significantly and immediately reduced when donning a MEWHO, and these changes exceeded the UEFM's clinically important difference threshold. Further, utilization of a MEWHO significantly increased gross manual dexterity and performance of certain functional tasks.