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A RANDOMIZED COMPARATIVE STUDY OF MANUALLY ASSISTED VERSUS ROBOTIC-ASSISTED BODY WEIGHT SUPPORTED TREADMILL TRAINING IN PERSONS WITH A TRAUMATIC BRAIN INJURY.

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ABSTRACT

OBJECTIVES: (1) To compare the effects of robotic-assisted treadmill training (RATT) and manually assisted treadmill training (MATT) in participants with traumatic brain injury (TBI) and (2) to determine the potential impact on the symmetry of temporal walking parameters, 6-minute walk test, and the mobility domain of the Stroke Impact Scale, version 3.0 (SIS).

DESIGN: Randomized prospective study.

SUBJECTS: A total of 16 participants with TBI and a baseline over ground walking self-selected velocity (SSV) of ≥0.2 m/s to 0.6 m/s randomly assigned to either the RATT or MATT group.

INTERVENTION: Gait training for 45 minutes, 3 times a week with either RATT or MATT for a total of 18 training sessions.

OUTCOME MEASURES: Primary: Overground walking SSV, maximal velocity. Secondary: Spatiotemporal symmetry, 6-minute walk test, and SIS.

RESULTS: Between-group differences were not statistically significant for any measure. However, from pretraining to post-training, the average SSV increased by 49.8% for the RATT group (P = .01) and by 31% for the MATT group (P = .06). The average maximal velocity increased by 14.9% for the RATT group (P = .06) and by 30.8% for the MATT group (P = .01). Less staffing and effort was needed for RATT in this study. Step-length asymmetry ratio improved during SSV by 33.1% for the RATT group (P = .01) and by 9.1% for the MATT group (P = .73). The distance walked increased by 11.7% for the robotic group (P = .21) and by 19.3% for manual group (P = .03). A statistically significant improvement in the mobility domain of the SIS was found for both groups (P ≤ .03).

CONCLUSIONS: The results of this study demonstrate greater improvement in symmetry of gait (step length) for RATT and no significant differences between RATT and MATT with regard to improvement in gait velocity, endurance, and SIS. Our study provides evidence that participants with a chronic TBI can experience improvements in gait parameters with gait training with either MATT or RATT.

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