Effects of Conventional Therapy vs. Robotic-Assisted Gait Training on Gait and Functional Outcomes in Stroke Patients: A Systematic Review and Meta-Analysis

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Abstract:

Introduction: Stroke commonly results in impaired gait and reduced functional independence, requiring effective rehabilitation strategies. Conventional therapy remains the standard approach, while robotic-assisted gait training (RAGT) offers task-specific, repetitive training to enhance recovery.

Objective: To compare the effects of conventional therapy and RAGT on gait parameters and functional outcomes in stroke patients.

Methodology: A systematic review and meta-analysis of 10 randomized controlled trials involving acute and subacute stroke patients was conducted. Outcomes included gait parameters (gait speed, cadence, step length, stride length) and functional measures (6-Minute Walk Test, 10-Meter Walk Test, Functional Ambulation Category). Pooled effect sizes and confidence intervals were analyzed.

Results: Conventional therapy improved gait speed and cadence but had limited effects on step and stride length. RAGT showed greater improvements in gait velocity (SMD = 0.62), stride length, and cadence. No significant differences were found for 6-Minute Walk Test (SMD = 0.18) and 10-Meter Walk Test (SMD = 0.22). However, RAGT significantly improved functional ambulation (FAC: SMD = 0.56, p = 0.003).

Conclusion: Both interventions are beneficial, but RAGT provides additional value in improving walking independence. Integrating RAGT into rehabilitation may enhance functional recovery in stroke patients.