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Is there an Association Between Caregiver Factors and Rehabilitation Outcomes in Stroke?

Peck Hoon ONG (Saw Swee Hock School of Public Health), Gerald Choon-Huat Koh, Bee-Choo Tai, Wai-Pong Wong, Liang En Wee, Cynthia Chen, Angela Cheong, Ngan Phoon Fong, Kin Ming Chan, Boon Yeow Tan, Edward Menon, Kok Keng Lee, Robert Petrella, Amardeep Thind

Research Objectives: To evaluate the relationship between caregiver factors and rehabilitation outcomes in subacute stroke patients.

Design: Retrospective cohort study.

Setting: Four subacute inpatient rehabilitation units in Singapore.

Participants: 4042 subacute stroke patients.

Interventions: Not applicable.

Main Outcome Measure(s): (i) Rehabilitation effectiveness (REs), defined as the percentage of potential achievement improved with rehabilitation; and (ii) rehabilitation efficiency (REy), defined as the rate of functional improvement during rehabilitation.

Results: Among stroke survivors undergoing inpatient rehabilitation, 96.73% had potential caregivers, of which 41.97% were supported by foreign domestic workers (FDWs), 25.86% by spouses and 19.28% by first-degree relatives. At the bivariate level, caregiver availability and caregiver identity was significantly associated with REs and REy (all p < 0.05), whilst the number of caregivers was only significantly associated with REs (p = 0.006). After adjusting for identified confounders using quantile regression, having a caregiver was associated with poorer REy (-3.83, 95% CI -6.99 to -0.66, p = 0.018). We found a significant interactive effect between gender and caregiver availability with respect to REs. Though REs is lower in general amongst those with caregivers, the difference was significantly greater among males (-22.81, 95% CI -32.70 to -12.94, p < 0.001). In terms of caregiver identity, having a FDW as a caregiver was associated with poorer REs (-3.95, 95% CI -6.94 to -0.95, p = 0.01) and REy (-1.83, 95% CI -3.14 to -0.53, p = 0.006) when compared to spousal caregivers. Interestingly, having non-relative, unpaid caregivers was associated with better REs (8.36, 95% CI 1.89 to 14.83, p = 0.011).

Conclusions: Caregiver availability and identity appears to be associated with rehabilitation outcomes. A better understanding of these relationships has potential implications on current and future clinical practice and policy directions.

Key Words: Stroke, caregivers, treatment outcome, Rehabilitation

Disclosures: None disclosed.

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Complexity and Fractal Dynamics of Gait in Treadmill Ambulation: Implications for Rehabilitation Providers

John Hollman (Mayo Clinic), Molly K. Watkins, Angela C. Imhoff, Carly E. Braun, Kristen A. Akervik, Debra K. Ness

Research Objectives: Evidence is emerging that treadmill training for rehabilitative purposes may constrain the locomotor system and alter gait dynamics in ways that mimic pathological states. The objective of this study was to examine if complexity and fractal dynamics of inter-stride gait parameters differ between overground and treadmill ambulation. We hypothesized that walking on a treadmill would induce less complex and less self-similar (i.e., more random) gait dynamics.

Design: Single group within-subjects design.

Setting: Gait laboratory.

Participants: A volunteer sample of 20 healthy subjects who were free of gait disorders and were experienced treadmill-users participated.

Interventions: Not applicable.

Main Outcome Measure(s): Participants walked at preferred walking speeds for 6 minutes overground in a hallway and on a motorized treadmill while wearing inertial sensors. Stride time, stride length and peak trunk velocities were measured. Mean values and nonlinear estimates of complexity and fractal dynamics were calculated for each gait parameter and compared between the overground and treadmill conditions.

Results: Mean values for each gait parameter were statistically equivalent between overground and treadmill ambulation (P > .05). Through nonlinear analyses, however, complexity in stride time variability (P < .001) and long-range correlations in stride time and stride length data (P = .005 and P = .024, respectively) were reduced on the treadmill.

Conclusions: Treadmill ambulation induces more predictable inter-stride time dynamics and constrains patterns of variability in stride times and stride lengths, which may alter feedback from destabilizing perturbations normally experienced by the locomotor control system during overground ambulation. Treadmill ambulation, therefore, may provide less opportunity for experiencing the adaptability necessary to successfully ambulate overground. Rehabilitation providers and investigators should be aware that treadmill ambulation will alter dynamic gait characteristics.

Key Words: Locomotion, Treadmill test, Nonlinear dynamics

Disclosures: None disclosed.

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Mediators of Change through Holistic Neuropsychological Rehabilitation: A Modest Proposal

Keith Cicerone (JFK Johnson Rehabilitation Institute)

Research Objectives: To investigate factors mediating change through neuropsychological rehabilitation. We hypothesized that changes in metacognitive and emotional regulation would mediate perceived self-efficacy for managing cognitive and emotional symptoms, which would predict perceived quality of life (Cicerone & Azulay, 2007).

Design: Single-group before-after trial with exploratory analysis of hierarchical change scores.

Setting: Comprehensive out-patient brain injury rehabilitation program in a suburban rehabilitation hospital.

Participants: 40 patients referred for brain injury rehabilitation at least 6 months post-injury.

Interventions: Holistic neuropsychological program (Cicerone et al., 2008), conducted three days a week for 16 weeks, combining individual neuropsychological treatment (4 hours) and group intervention (11 hours). Treatment incorporated specific interventions for metacognition (self-monitoring and self-regulation) and emotional regulation.

Main Outcome Measure(s): Social Problem Solving Inventory-Revised (SPSI-R), Disorders of Emotional Regulation scale (DERS), Working Alliance Inventory (WAI), Self-Efficacy for Symptom Management scale (SEsx), Perceived Quality of Life scale (PQOL).

Results: Relationships among changes scores were conducted to select and limit possible mediating variables from subtests of the SPSI-R and DERS (Sainani, 2013). Hierarchical linear regression was used to examine the relation of proposed mediating variables to SEsx and PQOL, controlling for baseline status and the working alliance. Improvements in the use of Rational Problem Solving (RPS) strategies and Access to Emotional Regulation Strategies (ERS) mediated improvements in SEsx . Improvements in emotional and awareness mediated changes in RPS and ERS. Changes in SEsx, problem orientation and emotional interference contributed to discharge PQOL.

Conclusions: Improvements in RPS and ERS specific interventions embedded in holistic neuropsychological rehabilitation mediate improved SE for the management of cognitive and emotional symptoms. Improvements in emotional awareness and impulse control may be prerequisites application of metacognitive and emotional regulation strategies. Validation with adequate samples and statistical modeling is indicated.

Key Words: Brain Injury, Neurorehabilitation, Treatment Outcome

Disclosures: None disclosed.

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Comparison of Different Antibiotic Protocols for Asymptomatic Bacteriuria Treatment in Patients with Neurogenic Bladder Who Underwent Detrusor Botulinum Toxin Injection

Ana Claudia Paradella (Hospital Sarah), André Ferraz De Arruda Musegante, Carlos Roberto Brites