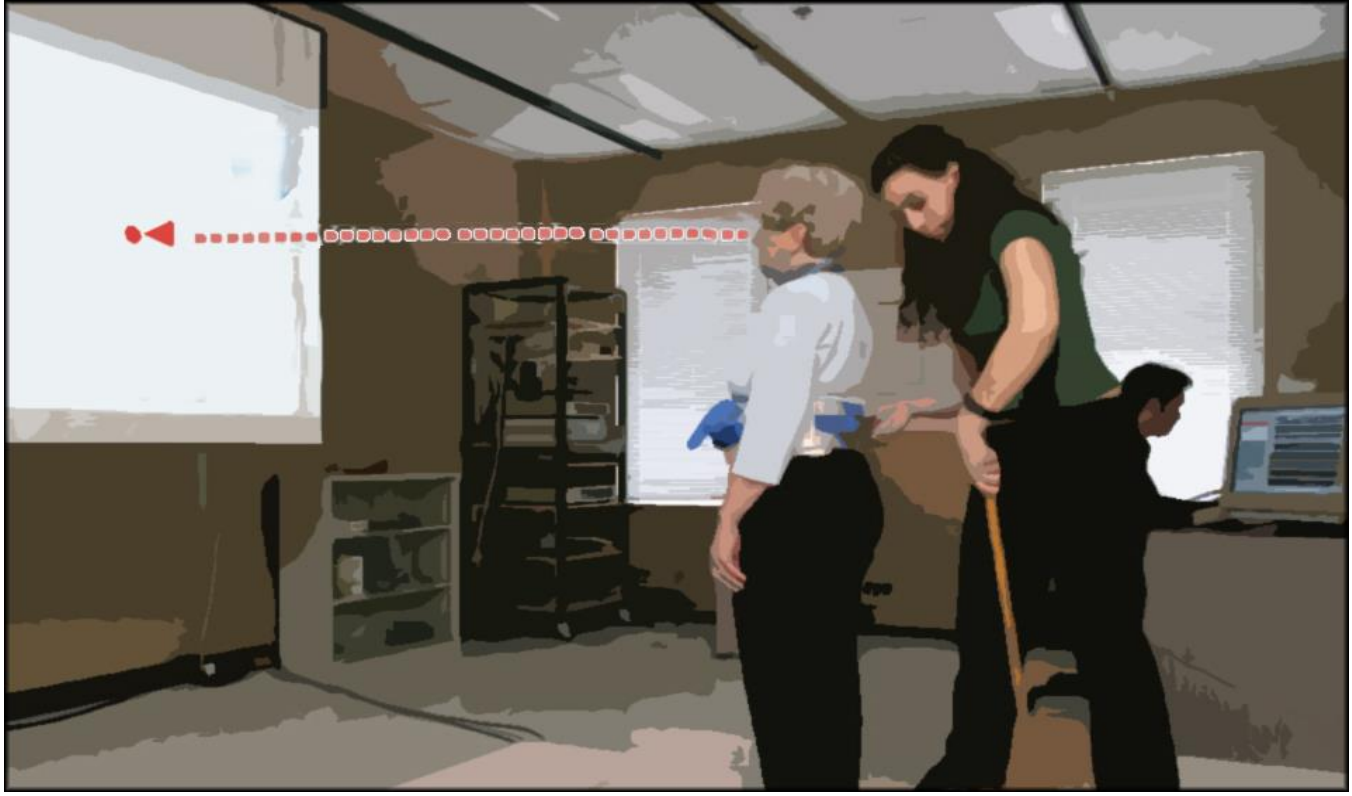


DM Laing, Gaze and Postural Stability

RESEARCH REVIEW: *Rehabilitation to Improve Gaze and Postural Stability in People with Multiple Sclerosis.* *Lloyd, Fangman, Peterson et al., (2022)*

by Gail A. Creaser PT, MA

KEY POINTS

1. People with Multiple Sclerosis (PwMS) improve significantly in self-reported dizziness and balance confidence following either (a) an exercise program of focused gaze and postural stability (GSP) or (b) strength and endurance (SAE) exercises.

2. A 6-wk program of GSP exercise was not superior to SAE training to improve the participants' perceived disability as indicated by the Dizziness Handicap Inventory (DHI).

3. Vestibular rehabilitation is beneficial compared to no treatment for MS-related dizziness and balance insecurity[1], but a paucity of research comparing interventions limits our knowledge of the best treatment recommendations, optimal dosage, and meaningful measures of improvement.

Background and Objective

- Vestibular-related dysfunction has been reported by 30% – 59% of people living with multiple sclerosis (PwMS).
- Dizziness/vertigo, blurring vision, motion sensitivity and/or poor postural control can lower balance confidence, contribute to falls, and restrict participation.
- The study's purpose was to determine the efficacy of a gaze and postural stability intervention (GPS) compared to strength and aerobic exercise training (SAE), considered usual care for PwMS.
- The hypotheses were that GPS participants, when compared to SAE, would demonstrate:

1) greater improvement in Dizziness Handicap Inventory (primary outcome) scores from baseline to 6-weeks
2) greater improvement of secondary outcomes at 6-week assessment, and
3) higher outcome scores would be maintained at 10 weeks.

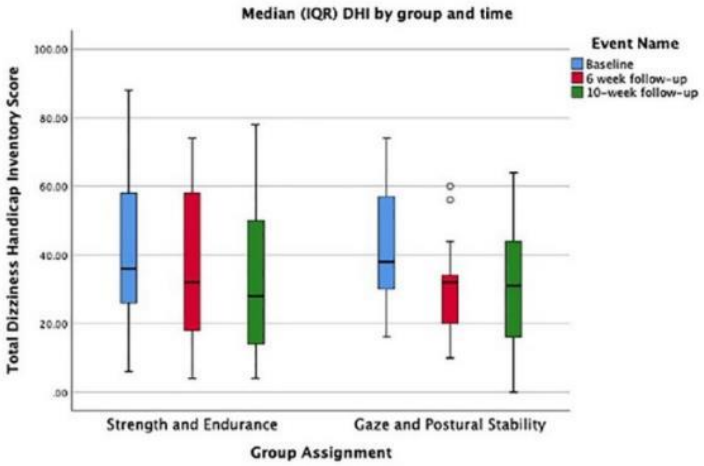
Method

- Single-blinded, 2-group, randomized clinical trial: PwMS aged 20 – 75 years.
- Participants were described by baseline demographic data, Expanded Disability Status Scale (EDSS), Dizziness Handicap Inventory (DHI), falls history, Activity-specific Balance Confidence Scale (ABC), Functional Gait Assessment (FGA), and computerized Dynamic Visual Acuity (cDVA).
- All participants had ≈ 45 minutes of individualized strengthening and cardiovascular endurance training 3x/wk for 6 weeks.
- GPS had 15 minutes each of gaze stability exercises and postural control training and a home exercise program (x5/wk).
- Blinded assessors evaluated outcomes at 6 and 10 weeks.

A restricted maximum likelihood estimation mixed effects model examined between group changes in the DHI at the primary and secondary time-points. Similar mixed effects analyses evaluated secondary outcomes.

Results

- 41 participants enrolled, and 35 completed 10-week testing (18 GPS, 17 SAE)
- Baseline cDVA and DHI scores of both groups were worse than expected in neurotypical adults.
- Both GPS and SAE groups demonstrated significant improvements in the DHI and secondary outcomes ABC and FGA at 6- and 10-week time-points.



Mean DHI difference between groups: 6-weeks 2.33 (95% CI: 9.18, 12.85); 10-weeks 1.09 (95% CI 11.71, 9.53). Small to moderate effect sizes, 0.45 and 0.34 GPS and SAE respectively, indicated either intervention improved dizziness, but minimal clinically important difference was not discussed.

DHI improvement was not significantly different between the GPS and SAE groups, thus the hypotheses for superior GPS results were not supported.

"benefits experienced during the training period were maintained at the 10-week timepoint in both groups"

ABC results were similar across groups; however, the GPS effect size (Cohen's d = 0.70) was medium-large while a small-medium effect size was observed in the SAE group (Cohen's d = 0.49).

Limitations

- Supplementary material clearly described the GPS and SAE protocols and the guidelines for intervention progression.
- Considering the variability in MS presentation and disease progression, a larger sample with better-defined inclusion/exclusion criteria may have resulted in less variability across the outcomes measured.
- Participants in both groups represented mild MS disability [mean EDSS 3.6][1] of at least 20 years duration, likely limiting the study's generalizability to other MS disability levels.
- The DHI and ABC are patient reported outcomes, yet minimal clinically important differences (18 points and 18.1%, respectively)[2] were not discussed, limiting readers' perceptions of the significance improvement held for participants.

Clinical Implications

- PwMS experiencing dizziness and impaired balance can likely benefit from progressive exercises focused on improving elements of gaze and postural control, as well as strengthening and endurance training.
- Gains made during the 6-week intervention were maintained for 4 weeks without instructions for exercise/physical activity maintenance. Further research is needed to provide PwMS the most effective guidelines for long-term management.
- Research is also needed to determine if characteristics of PwMS can predict responsiveness to interventions, thus optimizing personalization of care that results in the most meaningful improvement.

RESEARCH STUDY

Loyd, B. J., Fangman, A., Peterson, D. S., Gappmaier, E., Thackeray, A., Schubert, M. C., & Dibble, L. E. (2022). Rehabilitation to Improve Gaze and Postural Stability in People With Multiple Sclerosis: A Randomized Clinical Trial. *Neurorehabilitation and neural repair, 36*(10-11), 678–688. doi.org/10.1177/15459683221124126

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MEET THE REVIEWER

Gail Creaser has recently retired as a Lecturer at Dalhousie University's School of Physiotherapy; however, she currently continues as a Lab Instructor.

Her clinical practice at the Nova Scotia Rehabilitation Centre focused on adult neurorehabilitation, spasticity management, and the role of vestibular rehabilitation —particularly for people with multiple sclerosis or post-stroke.