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EDITORIAL

Use of virtual reality in balance and gait training post-stroke



Impaired gait is one of the most common functional problems encountered by stroke patients, steering researchers to search for effective intervention strategies to improve ambulatory function post-stroke. In the past decade, the introduction of virtual reality systems has provided an innovative method to retrain gait function in individuals with stroke, and it has also attracted increasing attention in stroke research [1–6]. In this issue of the *Hong Kong Physiotherapy Journal*, Lee et al [7] reported a randomized controlled study that examined the effects of an augmented reality-based (a type of virtual reality) postural control training on gait function in people with stroke. Following 4 weeks of daily training, individuals in the experimental group who received conventional therapy and additional virtual reality-based training showed significantly more improvement in walking velocity, step length, and stride length on both sides compared with those in the control group who received only conventional therapy. While this study had several limitations such as the relatively small sample size and lack of attentional control, the results do provide the basis for future larger-scale randomized controlled studies to investigate this new method of training gait function post-stroke.

References

- [1] Deutsch JE, Paserchia C, Vecchione C, Mirelman A, Lewis JA, Boian R, et al. Improved gait and elevation speed of

- individuals post-stroke after lower extremity training in virtual environments. *J Neurologic Phys Ther* 2004;28:185–6.
- [2] You SH, Jang SH, Kim YH, Hallett M, Ahn SH, Kwon YH, et al. Virtual reality-induced cortical reorganization and associated locomotor recovery in chronic stroke: an experimenter-blind randomized study. *Stroke* 2005;36:1166–71.
- [3] Fung J, Richards CL, Malouin F, McFadyen BJ, Lamontagne A. A treadmill and motion coupled virtual reality system for gait training post-stroke. *Cyberpsychol Behav* 2006;9:157–62.
- [4] Yang YR, Tsai MP, Chuang TY, Sung WH, Wang RY. Virtual reality-based training improves community ambulation in individuals with stroke: a randomized controlled trial. *Gait Posture* 2008;28:201–6.
- [5] Mirelman A, Bonato P, Deutsch JE. Effects of training with a robot-virtual reality system compared with a robot alone on the gait of individuals after stroke. *Stroke* 2009;40:169–74.
- [6] Walker ML, Ringleb SI, Maihafer GC, Walker R, Crouch JR, Van Lunen B, et al. Virtual reality-enhanced partial body weight-supported treadmill training poststroke: feasibility and effectiveness in 6 subjects. *Arch Phys Med Rehabil* 2010;91:115–22.
- [7] Lee CH, Kim Y, Lee BH. Augmented reality-based postural control training improves gait function in patients with stroke: randomized controlled trial. *Hong Kong Physiother J* 2014;32:51–7.

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