

1. 請論述單側大腦中風、帕金森氏症患者其平衡控制問題、治療重點有何異同？(15%)
2. 請閱讀以下文獻內容，並回答下列問題：

Silsupadol P, Shumway-Cook A, Lugade V, van Donkelaar P, Chou LS, Mayr U, Woollacott MH. Effects of single-task versus dual-task training on balance performance in older adults: a double-blind, randomized controlled trial. Arch Phys Med Rehabil. 2009; 90(3):381-7.

Abstract

Objective: To compare the effect of 3 different approaches to balance training on dual-task balance performance in older adults with balance impairment. **Design:** A double-blind, randomized controlled trial. **Participants:** Older adults (N=23) with balance impairment (mean age, 74.8y). They scored 52 or less on the Berg Balance Scale (BBS) and/or walked with a self-selected gait speed of 1.1m/s or less. **Interventions:** Participants were randomly assigned to 1 of 3 interventions: single-task training, dual-task training with fixed-priority instructions, and dual-task training with variable-priority instructions. Participants received 45-minute individualized training sessions, 3 times a week for 4 weeks. **Main outcome measures:** Gait speed under single-task and dual-task conditions was obtained at baseline, the second week, the end of training, and the twelfth week after the end of training. Other measures, including the BBS and the Activities-specific Balance Confidence (ABC) Scale, were collected at baseline and after training. **Results:** Participants in all groups improved on the BBS ($P<.001$; effect size [ES]=.72), and walked significantly faster after training ($P=.02$; ES=.27). When a cognitive task was added, however, only participants who received dual-task training with fixed-priority instructions and dual-task training with variable-priority instructions exhibited significant improvements in gait speed ($P<.001$, ES=.57; and $P<.001$, ES=.46, respectively). In addition, only the dual-task training with variable-priority instructions group demonstrated a dual-task training effect at the second week of training and maintained the training effect at the 12-week follow-up. Only the single-task training group showed a significant increase on the ABC after training ($P<.001$; ES=.61).

Intervention

The 4-week balance training program used progressive activities related to body stability (eg, standing with eyes closed, tandem standing, and standing on compliant surfaces), body stability plus hand manipulation (eg, standing on foam with rapid alternating hand movement or while throwing and catching a ball, and tandem standing while holding a basket), body transport (eg, narrow walking, walking backward, and transferring from 1 chair to another), and finally body transport plus hand manipulation. The participants in the single-task balance training group received balance activities under single-task conditions (only balance tasks were given). The participants receiving dual-task training with fixed-priority instructions practiced balance tasks while simultaneously performing cognitive tasks, and were instructed to maintain attention on both postural and cognitive tasks at all times. Examples of cognitive tasks included naming

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objects and remembering numbers, and have been described in detail elsewhere. Participants in the dual-task training with variable-priority instructions participated in the same set of activities as the dual-task training with fixed-priority instructions group, but spent half the session focused on balance and half focused on cognitive task performance.

Outcome measures

The primary outcome measure was self-selected gait speed under single-task and dual-task conditions. Participants walked 10m at their comfortable speed, and the time to complete the middle 6m was recorded using a stopwatch. In the dual-task condition, participants responded to addition/subtraction questions (eg, 2+4) while walking.

Secondary outcomes included the BBS and the ABC Scale. The BBS was used to quantify balance performance under single-task conditions on tasks such as standing with eyes closed, standing with feet together, and picking up an object from the floor. The ABC was used to determine self-reported confidence when performing 16 different daily activities, such as walking around the house, walking up and down stairs, and walking on slippery floors. A confidence rating scale ranges from 0% to 100%, with 0% indicating no confidence and 100% indicating full confidence.

- 1) 請依照文獻內容，整理該研究之結論，並論述其發現與一般物理治療於臨床上治療平衡問題不同之處。(15%)
- 2) 請以該研究結果之概念，設計單側大腦中風、巴金森氏症患者的平衡治療，並舉例說明。(20%)
3. 請分別說明下列五種治療原理/策略之(1) 基本治療原則，及(2) 舉例說明於脊髓損傷患者之臨床應用。(每種治療原則 10%;共 50%)

- **Compensation**
- **Function or anatomical approach- muscle reeducation**
- **Neurofacilitation approach**
- **Psycho-educational approach**
- **Contemporary theories (ICF, task-oriented approach)**

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