EFFECTS OF VIRTUAL REALITY BALANCE TRAINING ON POSTURAL STABILITY AND DUAL-TASK RESPONSES IN PATIENTS WITH PARKINSON’S DISEASE

Chang-Yi Yen, Kwan-Hwa Lin, Ming-Hsia Hu, Ruey-Meei Wu, Pei-Fang Tang, Tung-Wu Lu, Chia-Cheng Lin

School and Graduate Institute of Physical Therapy, National Taiwan University, Taipei, Taiwan
Department of Neurology, National Taiwan University, Taipei, Taiwan
Institute of Biomedical Engineering, National Taiwan University, Taipei, Taiwan

INTRODUCTION
Postural instability is common in subjects with Parkinson’s disease (PD) [1, 2]. The virtual reality (VR) training was used in stroke rehabilitation [3]. The purpose of this study was to investigate the short tem and long term effects of VR balance training on sensory, motor and cognitive domains of postural stability, while compared with physical therapy conventional balance (CB) training and untrained control group (CG).

METHODS
This was a single blind randomized control trial. Forty-two PD patients (age: 70.6±6.3y/o; Hoehn and Yahr Stage:2–3) were allocated into VR group (n=14), CB group(n=14) and CG group (n=14) by stratified randomization. Both training groups received 6 weeks intervention (2 sessions/week, 30 min/session) but the control group did not receive any kind of therapy. Each subject received assessments of postural stability before and after training period and at 4 weeks follow-up, including Sensory Organization test (SOT) with dual task paradigm and Limits of Stability test (LOS) by SMART balance master (Neurocom®). The 3-way mixed ANOVA (3 Groups x 3 Times x 2 Tasks) was used to test our hypotheses with intention to treat analysis.

RESULTS AND DISCUSSION
VR and CB training significantly increased equilibrium score (ES) of SOT 6 either in single or dual task condition, and the improvements tended to be maintained for at least 4 weeks (Figure 1). However, only VR had significant difference with control group after training.

CONCLUSIONS
VR training could improve sensory and motor control of static and dynamic balances. The training effect of either single or dual task on postural stability could be maintained after VR training. Therefore, we suggested VR balance training could be added into conventional rehabilitation programs to improve postural stability in PD patients.

ACKNOWLEDGEMENTS
This study was supported by the grant NSC 97-2314-B-002-009-MY3

REFERENCES