CHAPTER 5

CONCLUSION OF THE STUDY

Overall, the purpose of the present study was to investigate motor and cognitive performance in individuals with MCI; the high risk group for developing a progressive decline of cognitive and motor functions. Early detection of cognitive and motor changes as well as an intervention approach for individuals with MCI are essential for clinical management. The first study was a preliminary study aimed to develop the cognitive training program that focuses on the core impairment aspects of individuals with MCI including memory, attention and executive function and determine its short-term effect after 18 training sessions. The effect of this program was determined via cognitive function and neurochemistry biomarkers in three brain areas (i.e. the hippocampus, PFC and ACC). After completing the 6-week cognitive training program, the experimental group demonstrated significant improvement in three cognitive domains which accompanied by the decrement in mI/Cr ratio in all three brain areas. The developed cognitive training program showed promising evidence in improving cognitive function of individuals with MCI. The study findings suggest that the cognitive training program may potentially be an effective interventional approach to delay the cognitive decline in individuals with MCI.

The second study aimed to investigate motor performance in individuals with MCI by way of assessment gait performance in challenging condition as adding secondary task during gait initiation and termination. The results showed that individuals with MCI had greater spatial variability during gait initiation, particularly in a condition involving a secondary cognitive task. This finding indicates that individuals with MCI have an impairment to regulate their gait pattern during gait initiation, particularly in a condition involving a secondary cognitive task. For gait termination, however, adding a cognitive load had similar effects on mean gait parameters between the two groups. Future studies on spatiotemporal variability may further advance our understanding on the changes in gait control during gait termination.

There is increasing evidence that individuals with MCI have been associated with impaired physical function. The last study aimed to examine whether objectively defined MCI is a risk factor for accelerated physical decline over time. In accordance with the hypothesis, we found that physical decline was significantly greater in individuals with MCI after controlling for potential confounders. In addition, among four cognitive domains (i.e. memory, language, attention and executive functions), impaired executive function was found to be significantly associated with physical decline over 1 year. These findings may potentially reflect the risk of fall and underscore the need for developing fall risk screening that cover both physical and cognitive tests among this population.

In summary, our findings from the second and the third studies showed the changes in motor performance related to falls in individuals with MCI, reflected via greater composite PPA score and greater spatial variability during gait initiation under dual-task condition than those in cognitively intact controls. Moreover, the third study also showed that individuals with MCI also suffer a faster physical decline over time. These information, therefore, have a clinical message for providing an early

intervention approach among this population. Findings from the first preliminary study have shown a beneficial effect of a cognitive training program in improving cognitive performance of individuals with MCI. Therefore, cognitive training program may be considered as an alternative option of non-pharmacological treatment to restore or slow down the cognitive decline in individuals with MCI. The findings from the three sub-studies support ongoing research about the association between MCI, impaired motor performance and risk of falls as well as offer a potential intervention approach to enhance cognitive performance of individuals with MCI. This combination of findings provides some support for the conceptual premise that motor and cognitive impairment should be the clinical entity of individuals with MCI. Consequently, an effective program focused on training both motor and cognitive aspects should be implemented at an early stage.

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