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SULEEPORN CHEEWAPANICH : EFFECTS OF TREADMILL LOCOMOTOR TRAINING ON WALKING PERFORMANCE IN INDIVIDUALS WITH HEMIPLEGIA AGED 9-18 YEARS. THESIS ADVISORS : CHANUT AKAMANON, M.A., JONJIN RATANAPINUNCHAI, Ph.D. 162 P. ISBN 974-663-471-2

The most frequently stated functional goal of individuals with ambulatory hemiplegia was restoration of the ability to walk at a reasonable speed and at an effective performance level. The study was planned to determine the possible changes made by treadmill gait training on walking performance. Eighteen individuals with hemiplegia (age 9-18 years) were recruited in the study. The control group (n=9) received only conventional therapy and the experimental group (n=9) received both conventional therapy and treadmill locomotor training. Changes in locomotor performance were evaluated with three clinical measures:, first the temporal-distance (TD) gait variables (walking velocity, cadence, step length, stride length, and step width), second the energy expenditure index (EEI), and, finally the strength of six muscle groups of both the sound side and the affected side of the lower limbs (hip flexors and extensors, knee flexors and extensors, ankle dorsiflexors and plantar flexors). These clinical measures were evaluated before training, at 6-week and at 12-week training periods. At the 6-week training period, the experimental group demonstrated significantly greater changes than the control group concerning the stride length of the sound side ($p=0.018$) and the strength of plantar flexors of the affected side ($p=0.004$). At the 12-week training period, the experimental group continued to show significantly greater changes for overground walking velocity ($p=0.005$), sound side: step length ($p=0.034$) and stride length ($p=0.001$), affected side: step length ($p=0.007$) and stride length ($p=0.002$). Furthermore, there were significant changes for the plantar flexors of sound side ($p=0.004$). The significant changes of the affected side were hip extensors ($p=0.048$), knee extensors ($p=0.038$) and plantar flexors ($p=0.001$). Both periods showed that changes in energy expenditure were not significant between both groups. The present study indicates improvement in some aspects of gait with treadmill training in individuals with hemiplegia. This gait training strategy may be used as one of the approaches for patients with chronic gait dysfunction.