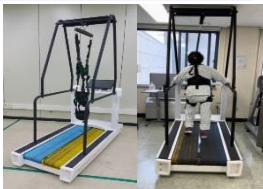


Introduction

- Patients with hemiplegia require an environment that enables the active use of their paralyzed limbs in functional movements, due to the diminished function of the lower limb on the paralyzed side.
- The objective of this study is to evaluate whether stroke patients with hemiplegia benefit in terms of gait and balance recovery from split-belt treadmill training versus same-belt training.
- In this study, we used split-belt treadmill(WALK WELLTM) training and patient's paretic limb was trained at a slower speed to reduce gait asymmetry and facilitate weight bearing. Through a randomized controlled trial, we aimed to validate the efficacy and safety of split-belt treadmill training.

Method

- Design : Prospective, single-center, randomized controlled trial
- Participants : 30 stroke patients were randomly allocated to the splitbelt treadmill training group (experimental) or same-belt treadmill training group (control)
- Intervention : The split-belt group underwent training with different velocities between belts and the same-belt group underwent training with identical velocities. All participants received 30 mins of treadmill training twice a day, 5 times per week for 3 weeks
- Outcomes : Evaluations were conducted at baseline (pre-test), 3 weeks (post-test), and 7 weeks (follow-up). Primary outcome measure was Berg Balance Scale (BBS). Secondary outcome measures included Functional Reach Test (FRT), Modified Functional Reach Test (mFRT), 10-Meter Walk Test (10MWT), Manual Muscle Test (MMT), and Korean Modified Barthel Index (K-MBI).



Results

Tables 1. Demographic characteristics of patients' population

	Experimental group (n=13)		Control group (n=13)	P-value
Age	55.23 (11.25)		67.51 (9.37)	0.189 ¹⁾
Gender	8(30.8%) : 5(19.2%)		7(26.9%) : 6(23.1%)	0.691 ²⁾
(Male:Female)				
K-MMSE	26.62 (3.75)		23.15 (4.26)	0.050 ³⁾

The data show mean ± standard deviation.
1) analyzed by Independent – t test 2) analyzed by Chi-square test. 3) analyzed by Mann-Whitney test.

Table 2. Primary and secondary outcome measures (BBS, 10MWT and K-MBI)

Data are mean (SD).

	Pre-test		Post-test		Follow-up		Time P value	Group P value	Time × Group P value
	Experimental	Control	Experimental	Control	Experimental	Control			
BBS	18.77 (10.76)	17.85 (13.65)	37.62 (10.88)	35.85 (10.90)	45.08 (7.34)	43.77 (8.05)	<0.001*	0.716	0.929
10MWT	46.38 (32.83)	65.59 (104.50)	21.34 (10.85)	27.85 (31.84)	15.21 (7.97)	17.35 (14.75)	0.026	0.516	0.636
K-MBI	54.08 (19.24)	62.54 (15.41)	79.15 (11.41)	80.15 (9.06)	88.77 (6.89)	87.54 (7.08)	<0.001*	0.485	0.166

Analyzed by RM ANOVA, Data are mean (SD). *p<0.05, significance
BBS: Berg Balance Scale; 10MWT: 10 Meter Walk Test; K-MBI : Korean Modified Barthel Index

- BBS scores improved from 18.77±10.76 at pre-test to 37.62±10.88 at post-test and to 45.08±7.34 at follow-up in the experimental group. In comparison, the control group showed BBT change from 17.85±13.65 at pre-test to 35.85±10.90 at post-test and to 43.77±8.05 at follow-up.
- The 10MWT reduced time from 46.38±32.83 sec at pre-test to 21.34±10.85 sec at post-test and 15.21±7.97 sec at follow-up in the experimental group, while the control group exhibited decline from 65.59±104.50 sec to 27.85±31.84 sec and 17.35±14.75 sec.
- Korean Modified Barthel Index (K-MBI) scores increased from 54.08±19.24 to 79.15±11.41 and to 88.77±6.89 over the three time points in the experimental group. The control group had K-MBI scores change from 62.54±15.41 to 80.15±9.06 and to 87.54±7.08.
- All changes of BBT, 10MWT, K-MBI were statistically significant within groups (p<0.05) but not between groups.
- The FRT/mFRT and MMT scores all showed improvement over the study period as well in the experimental group. The changes were not statistically significant between groups.

Conclusion

- This randomized controlled trial demonstrated significant improvements over time in gait and balance outcomes for both split-belt and same-belt treadmill training groups. However, between group differences were not statistically significant. Further large-scale studies are needed to verify split-belt treadmill treatments's superiority.