EVALUATION OF PHASE IV CARDIAC REHABILITATION EXERCISE TRAINING IN STROKE SURVIVORS

School of Sport & Exercise Sciences, University of Kent

S. Meadows & A. Ferrusola-Pastrana

A.Ferrusola-Pastrana@kent.ac.uk

Introduction

Stroke is a leading cause of disability worldwide and the third most common form of death after coronary heart disease and cancer (Luengo-Fernandez, Leal & Gray, 2015). One third of stroke survivors present long-term disability (Hankey et al., 2002), affecting the economic costs of treatment and post-stroke care, which are substantial. Research has provided evidence that performing low levels of physical activity is the most important modifiable prognostic factor for the abovementioned outcomes (Hankey *et al.,* 2002). Therefore, effective interventions to help with risk factor management, reducing disability and aid stroke recovery are needed. Exercise training (cardiovascular & strength) offers a potential means to alleviate the burden associated with long-term disability and improve stroke survivor quality of life (QoL). Cardiac rehabilitation programmes including these components (*e.g.* phase IV cardiac rehabilitation circuit class) have been identified as options for secondary prevention after stroke (Gitter & Halar, 1995). There is limited research applying cardiac rehabilitation training principles to stroke survivors. Thus, we aim to evaluate health and functional fitness parameters of stroke survivors participating in a Phase IV style cardiac rehabilitation circuit class.

Methods

25 stroke survivors (male = 11; female = 14; mean age 59 ± 14 years) with at least 3-months engagement in a weekly Phase IV-style circuit exercise class completed anthropometric (body mass index [BMI] & waist circumference), health (resting systolic [SBP] and diastolic [DBP] blood pressure), and functional capacity measurements (6-minute shuttle walking distance [6MWD], timed up & go [TUG] & bilateral grip strength [GS]).

Sessions consisted of cardiovascular warm-up at the beginning (15min) and cool down & stretches (10min) at the end. The main session was circuit based consisting of various aerobic (20min) and strength exercises (15min).

Results

Table 1. Participants' characteristics at baseline and after engaging for more than 3 months with exercise training. Data are mean ± SD. * Significant paired *t*-test compared to baseline ($p<0.05$).

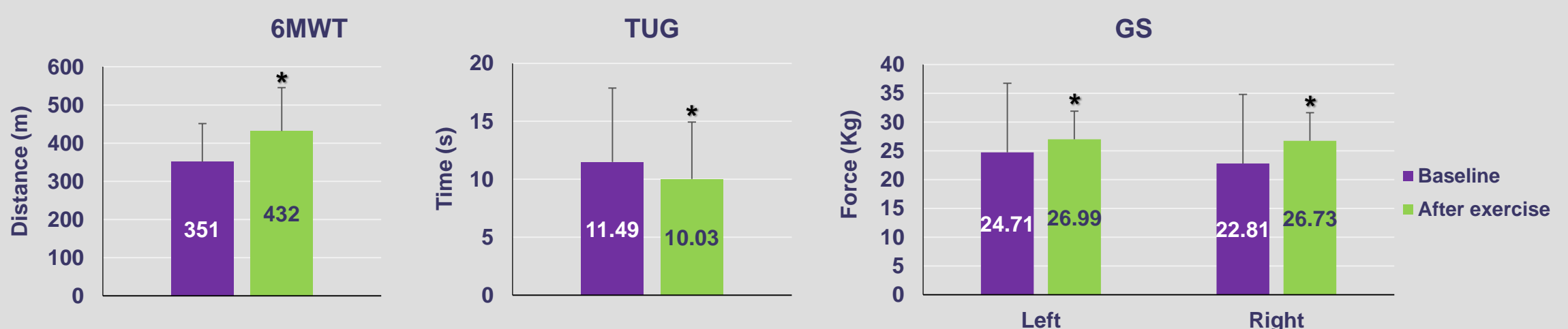| Measures	Baseline	After engaging with exercise for > 3 months
BMI (kg/m^2)	28.8 ± 4.9	29.1 ± 5.3
♀ Waist circumf. (cm)	90.8 ± 12.1	90.8 ± 12.9
♂ Waist circumf. (cm)	98.1 ± 11.3	97.6 ± 10.1
Resting SBP (mmHg)	142 ± 18	131 ± 14 *
Resting DBP (mmHg)	80 ± 12	77 ± 9 *

Figure 1. Functional capacity measurements; 6MWT (distance), TUG (time to stand, walk 3m, walk back and sit down) and GS (force). Data are mean ± SD. * Significant paired *t*-test compared to baseline ($p<0.05$).

Discussion and conclusion

Hypertension (HTN) is the single most important risk factor for stroke. Weekly exercise training improved the blood pressure status of participants to normotensive values from an initial state of HTN. However, anthropometric measures (*i.e.* BMI and waist circumference) remained unchanged. A reduction in disability and an improvement of functional capacity were achieved in 6MWD, TUG and GS. Taken together, weekly circuit-based exercise training offers considerable health and functional capacity benefits to stroke survivors potentially helping to promote recovery, QoL and reduce the disability burden.

References

Gitter, A., & Halar, E. M. (1995). *Physical Medicine and Rehabilitation Clinics*, **6**, 297-310.

Hankey, G. J., Jamrozik, K., Broadhurst, R. J., Forbes, S., & Anderson, C. S. (2002). *Stroke*, **33**, 1034-1040.

Luengo-Fernandez, R., Leal, J., & Gray, A. (2015). *BMJ open*, **5**, e006648.

University of Kent