Moderate-intensity cardiovascular fitness training to improve fitness, walking, mood and quality of life (QoL) following stroke. A feasibility randomised trial.

Reynolds H[1], **Steinfort S[1]**, Hayes A[2,3], Ellis S[1], Hanson E[2], Tillyard J[1], Wijeratne T[1], Skinner EH[1, 3, 4].

BACKGROUND

Cardiovascular fitness (CV) levels are significantly lower in stroke survivors. Optimal dosage and intensity of CV training following stroke remains unclear.[1]

AIMS

1. To determine the safety and feasibility of moderate-intensity CV training following stroke
2. To investigate potential effects on fitness (VO_2 peak), walking endurance and speed, depression and QoL

METHODS

- Prospective, patient and assessor blinded pilot trial
- Community rehabilitation centre (tertiary metro hospital)
- 20 participants: medically stable, ambulant (>100 m) and 6 weeks-12 months post stroke
- Participants attended 12 weeks, twice weekly for either:
  - Progressive, moderate-intensity CV fitness training (40-60% of Heart Rate Reserve (HRR))
  - Control exercise (HRR <40%)
  - Both groups: usual care, home exercise program

RESULTS

- 51% (72) of 141 screened participants were eligible
- 29% (41) declined to participate
- 49% (69) were excluded, mainly due to co-morbidities

Attendance and progression:

Mean attendance: intervention 74%; control 83%
Eighty percent of participants achieved 30 minute training duration, which took a mean of 10 sessions.
Progression of intensity was limited: only 50% of intervention participants reached intensities >50% HRR.

Safety:

There were no adverse events during testing or training.

Effect on VO_2 peak, walking, depression and QoL:

- Baseline VO_2 peak levels were low (15.94 ml/kg/min)
- Significant improvements in VO_2 peak for both groups and mood and mental QoL for the control ($p<0.05$).
- Although there were no significant between-group differences, this feasibility trial was not powered to detect change.

RESULTS: Baseline, Follow-up data and Change scores in all Outcome Measures (mean (SD))

	Baseline Intervention	Follow-up intervention	Change score Intervention	Baseline control	Follow-up control	Change score Control
VO_2 peak (ml/kg/min)	17.5 (2.9)	**20.1 (4.9)***	2.56 (2.69)	14.4 (3.7)	**17.4 (4.4)***	2.98 (2.63)
6 min walk (m)	400.9 (111.6)	443.4 (126.4)	42.5 (74.7)	344.8 (150.6)	370.9 (126.0)	26.1 (53.8)
10m walk: fast (m/s)	1.47 (0.36)	1.57 (0.41)	0.10 (0.31)	1.20 (0.47)	1.31 (0.52)	0.11 (0.18)
QoL: SF-36 physical	43.12 (8.65)	45.78 (8.97)	2.67 (6.41)	37.92 (10.16)	40.43 (9.90)	2.51 (11.18)
QoL: SF-36 mental	42.63 (14.72)	48.48 (17.65)	5.85 (9.31)	34.68 (20.35)	**46.19 (10.50)***	11.51 (14.86)
Mood: PHQ-9	7.0 (7.1)	4.2 (7.1)	-2.8 (7.4)	8.1 (6.2)	**3.8 (3.6)***	-4.3 (3.0)

* indicates a significant difference on paired samples t-tests for within group changes ($p<0.05$)

KEY DISCUSSION POINTS

1. The trial and intervention was feasible and safe.
2. Progression of duration and intensity was challenging. Progression was limited by BORG rating of perceived exertion score exceeding moderate intensity, self-reported fatigue and non-attendance.
3. Participants had a 'very poor' fitness classification at baseline;[2] below the minimum required for independent living.[3]
4. Limitations: underestimation of the training effect may occur due to an active control group and inadequate attendance or progression. A larger, adequately powered randomised trial is required.

SIGNIFICANCE TO ALLIED HEALTH

Poor fitness in stroke survivors can be improved through exercise intervention. Further study should investigate the impact on mood and QoL.

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Institutions:
1. Western Health, 2. Victoria University, 3. AIMSS, 4. The University of Melbourne

Contact: hanna.reynolds@wh.org.au