Low Physical Activity is Associated with High Blood Pressure and High Plasma Glucose in Stroke Survivors at 12 Months Following Rehabilitation

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Background

Stroke survivors are at a high risk of recurrent stroke and cardiovascular disease and are known to participate in low levels of physical activity (PA). Understanding the associations between PA and cardiovascular risk could be useful for developing effective preventative treatments.

Research Aims

To determine the relationship between PA and cardiovascular risk factors over the two years following rehabilitation discharge after first stroke.

Methods

- Primary stroke survivors from a metropolitan rehabilitation hospital were evaluated at rehabilitation discharge, six, 12 and 24 months later
- Primary outcome: moderate to vigorous PA (MVPA) duration (minutes/day) assessed with the Sensewear Armband
- Further outcomes were MVPA bout duration (minutes/day), light physical activity (LPA) duration and cardiovascular risk factors (eg blood pressure, fasting plasma glucose)
- Changes over time were evaluated with random effects
 regression modelling

Table 1: Associations Between Physical Activity and SystolicBlood Pressure and Plasma Glucose

Variable	Coefficient	Standard Error	t	р	95% Confidence Interval	
Systolic Blood Pressure						
MVPA 12 months	-0.043	0.024	-1.80	0.077	-0.090	0.005
MVPA 24 months	0.012	0.020	0.57	0.568	-0.029	0.053
Plasma Glucose						
MVPA Bout Duration 12 months	-0.001	0.005	-0.26	0.797	-0.011	0.009
MVPA Bout Duration 24 months	-0.004	0.002	-2.04	0.047*	-0.009	-0.001
LPA 12 months	0.000	0.003	0.13	0.895	-0.006	0.006
LPA 24 months	-0.006	0.003	-2.27	0.028*	-0.011	-0.001

* p < 0.05

Figure 1: MVPA and Systolic Blood Pressure over Two Years



 Associations between PA and cardiovascular risk factors were assessed with regression modelling.

Results

- Participants (n=57, 33% female) had mean age of 65 [SD 14] years and median gait speed o 1.2m/s (IQR 0.8,1.4)
- Physical activity and plasma glucose did not change over time
- Systolic blood pressure increased and at 24 months was higher than at baseline (by 2.7mmHg, p=0.05) (Figure 1)
- Associations (Table 1):
 - lower MVPA and higher systolic blood pressure at 12 months (p=0.077)
 - lower MVPA bout duration and higher plasma glucose at 24 months (p=0.047)
 - lower LPA and higher plasma glucose at 24 months

(p=0.028)











Discussion

At 12 and 24 months stroke survivors who completed less physical activity had higher blood pressure and plasma glucose and are therefore at a higher risk of future stroke and cardiovascular disease. Promoting strategies to incorporate MVPA and LPA into stroke survivors' lives should be a focus for health professionals.

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