

TWENTY-FIVE MINUTES PER DAY OF LEISURE TIME PHYSICAL ACTIVITY IS ASSOCIATED WITH LOWER CHRONIC DISEASE RISK IN ADULTS WITH SPINAL CORD INJURY

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Introduction

Background

- Epidemiological evidence suggests leisure time physical activity (LTPA) is associated with a 30 to 50% reduction in risk of cardiovascular disease (CVD) and type 2 diabetes in able-bodied persons
- It is unknown whether LTPA offers similar risk reduction in people with spinal cord injury (SCI)

Previous SCI LTPA-disease risk research

- Limited research has been conducted specific to the SCI population
- The few existent studies suggest greater physical activity is associated with lower disease risk (i.e., lower fasting glucose, abdominal obesity, triglycerides and/or inflammation, and higher HDL-cholesterol)
- Limited generalizability of these results to the larger SCI population, because the studies have focused primarily on active men with paraplegia
- Measures of physical activity used have not been designed for SCI population

We must understand the relationship between LTPA and disease risk among people with SCI

- CVD and diabetes prevalence are higher, and these diseases occur at younger ages, in SCI vs. able-bodied people
- People with chronic SCI have among the lowest levels of LTPA participation

Purpose

- To examine the relationship between LTPA and chronic disease risk factors in men and women living with paraplegia and tetraplegia

Hypotheses

- People who report more minutes of LTPA will have less body fat, smaller waist circumference, and lower insulin resistance, resting blood pressure, total cholesterol, LDL-cholesterol, triglycerides and C-reactive protein, and higher levels of fat-free mass and HDL-cholesterol, than those who report no LTPA

Methods

Participants: 56 men and women with SCI recruited from the *Study of Health and Activity in People with SCI (SHAPE SCI)*

Measures

LTPA: Physical Activity Recall Assessment for People with SCI was used to measure LTPA over a 3-day recall period

Body composition: BMI (i.e., weight [kg]/length [m²]), fat mass & fat-free mass measured with bioelectrical impedance analysis, and supine waist circumference measured at the lowest rib

Venous blood sample: Insulin & insulin resistance, cholesterol & triglycerides, and C Reactive Protein

Procedure:

- Telephone interview → LTPA data
- Home-based testing session → Demographic and disease-risk data

Descriptive Results

Participant Demographic Characteristics

Variable	Inactive (n=28) 0 min of LTPA/day	Active (n=28) > 25 min of LTPA/day
Age	41.1 ± 11.4	42.6 ± 13.0
Years Post Injury	16.5 ± 10.0	12.6 ± 10.2
Tetraplegia (n)	17	9
Paraplegia (n)	11	19
Men (n)	22	22
Women (n)	6	6

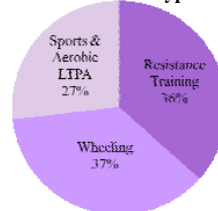
LTPA Among Active Participants

LTPA (min/day)	Tetraplegia (n=9)	Paraplegia (n=19)
Total LTPA**	55.6 ± 25.9	81.6 ± 56.5
Mild LTPA*	8.52 ± 23.2	31.6 ± 46.0
Moderate LTPA*	37.6 ± 34.7	44.2 ± 36.9
Heavy LTPA	9.44 ± 17.4	5.75 ± 10.2

**p = 0.01; *p = 0.03; +p = 0.09 (two-tailed)



Types of LTPA Reported



People with Tetraplegia

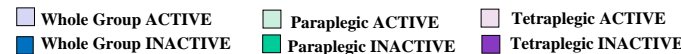


People with Paraplegia

Results – Legend

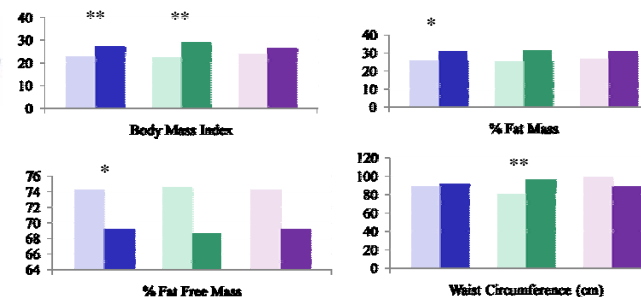
ACTIVE: ≥ 25 minutes LTPA per day

INACTIVE: 0 minutes LTPA per day

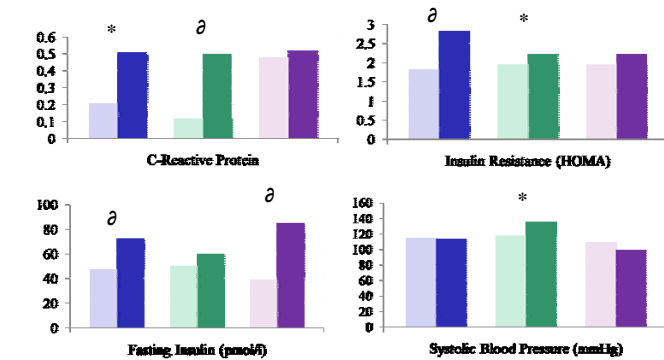


Significant Between-Group Differences $\partial p < .10$, * $p < .05$, ** $p < .01$

Results – Body Composition



Results Biochemical Markers & Blood Pressure



Discussion

This study is the first investigation of the association between physical activity and risk factors for chronic disease among people with SCI.

- Active (≥ 25 minutes/day of mostly mild and moderate LTPA) and inactive (0 minutes/day LTPA) individuals were compared on various risk factors

Physical activity was associated with some lower CVD and Type 2 diabetes risk factors at the biochemical and whole body levels.

- Body mass index, % fat mass, fasting insulin, insulin resistance and C-reactive protein were lower, and % fat-free mass was higher, in active vs. inactive people
- Active vs. inactive people with paraplegia, but not tetraplegia, also had lower systolic blood pressure and smaller waist circumference

Significant differences were not found between active and inactive individuals for fasting glucose, cholesterol, triglycerides or diastolic BP.

- Physical activity is not necessarily unrelated to these risk factors
- Non-significant differences may reflect variability in the types & intensities of LTPA performed

Strengths and Limitations

- Cannot infer a causal relationship due to the study's cross-sectional design
- Study was statistically underpowered to detect small effects
- First comprehensive examination of the LTPA-disease risk relationship
- SCI-specific measure was used to assess LTPA
- Results potentially generalizable to the Canadian SCI population

Conclusion

People who engage in ≥25 minutes/day of mostly mild to moderate intensity LTPA have some lower disease risk factors than people who engage in no LTPA.

- Whether these differences result in reduced prevalence of chronic disease needs to be determined.