

Accelerometer determined sedentary time is associated with increased pulse pressure in older adults



Yi Chao Foong¹, Greta Goldsmith², Dawn Aitken², Graeme Jones², James Sharman²

¹Barwon Health, Geelong, Victoria, Australia

²Menzies Institute for Medical Research, University of Tasmania, Tasmania, Australia

Introduction

Increased age and arterial stiffness are associated with increases in pulse pressure, which is more pronounced after the age of 50 years because systolic BP generally rises, whereas diastolic BP tends to fall, or stay stable [1]. Sedentary behaviour leads to increased blood pressure, and regular physical activity reduces blood pressure [2]. However, the extent to which elevated blood pressure associated with sedentary behaviour may be offset by regular physical activity is unknown [3].

Aim

The aim of this study was to determine relationship between sedentary behaviour, physical activity and pulse pressure in older adults.

Methods

Study participants (n=634, aged 66.3±7years; 49% male) were from a randomly selected community sample of older men and women aged 50-79 years. Average time spent per day in sedentary behaviour (sitting/lying) and physical activity (light, moderate and vigorous intensity) was determined by accelerometers (worn over 1 week).

Results

Multivariable Analysis

Model	Independent variable	B	P Value	95% CI for B	
				Upper	Lower
1	Sedentary time (%/day)	0.15	0.01	0.05	0.3
2	Light intensity activity (mins/day)	0.02	0.05	0.00	0.03
	Moderate intensity activity (mins/day)	-0.07	0.01	-0.12	-0.02
	Vigorous intensity activity (mins/day)	-0.23	0.11	-0.5	0.05
3	Sedentary time (%/day)	0.16	<0.01	0.06	0.28

- The average activity levels per day were: sedentary (584±94 min), light (227±72 min), moderate (32±25 min) and vigorous (1±4 min) intensity.
- Participants in the highest tertile of sedentary time had the highest pulse pressure (PP; t1=53±13, t2=54±13, t3=57±16 mmHg, p=0.014) and highest prevalence of isolated systolic hypertension (9.3%, p<0.001).

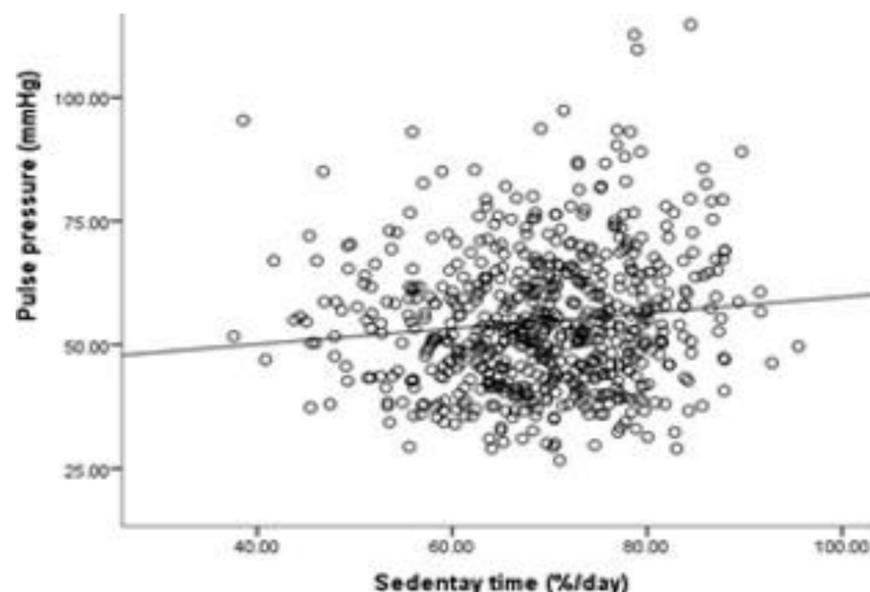
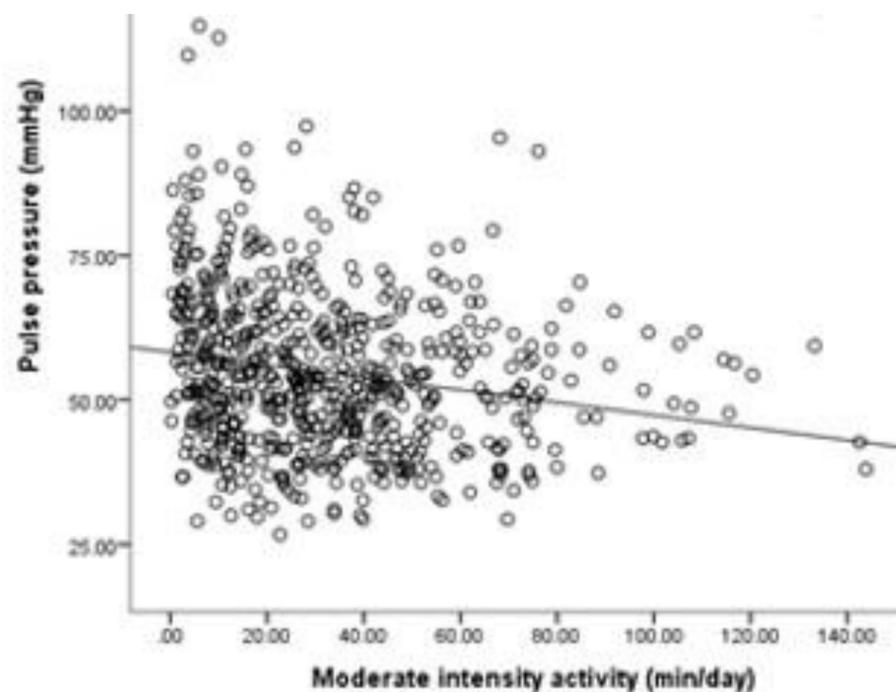


Figure 1: Pulse pressure by sedentary time per day in %

- Sedentary time was significantly associated with pulse pressure (r=0.110; p=0.005). This association remained significant on multiple regression analysis after adjustment for physical activity levels, sex, body mass index and presence of diabetes ($\beta=0.158$; p=0.005).
- Age was also associated with pulse pressure and the relationship between sedentary time and pulse pressure was both independent of, and partially mediated by, age.



Conclusions

- We conclude that increased time spent sedentary is independently associated with increased pulse pressure in older adults and could be one reason why pulse pressure increases with age.
- The findings also suggest that decreasing sedentary behaviour in older people could help achieve better blood pressure control, regardless of the level of physical activity.

References

- Madden et al, Diabetes Care 2009; 32:1531-35.
- Gando et al, Hypertension 2010; 56:540-46.
- Bassuk et al, J Appl Physiol 2005; 99::1193-1204.