



Correlation between Physical Activity and Arterial Stiffness in Korean Office Workers: A Community-Based Study

Tae-Kyung HAN¹, Dong-Hyun KIM², Sang-Gu WOO¹, Wi-Young SO³, *Dong Jun SUNG⁴

1. Physical Education, Andong National University, Andong, Republic of Korea
2. College of Sport Science, Sungkyunkwan University, Suwon, Republic of Korea
3. Sports and Health Care Major, Korea National University of Transportation, Chungju-si, Korea
4. College of Science and Technology, Konkuk University, Chungju-si, Korea

*Corresponding Author: Email: sls98@kku.ac.kr

(Received 14 Jul 2015; accepted 22 Aug 2015)

Dear Editor-in-Chief

Arterial stiffness is one of the most important determinants of increased systolic arterial pressure and pulse pressure, and is closely associated with hypertension, hyperlipidemia, type 2 diabetes mellitus, and artery hardening (1-2). The American College Sports Medicine guideline states regular exercise can prevent and treat cardiovascular system dysfunction including arterial stiffness (3). However, the meta-analysis of Williams (2001) shows physical fitness level owing to regular exercise and levels of daily physical activity (PA) are independent cardiovascular risk factors (4). As PA has also been reported to protect the cardiovascular system via increased physical fitness level, additional studies are required to clarify the associations between PA level and cardiovascular risk factors. In particular, the association between PA and arterial stiffness requires clarification.

Therefore, this study investigated the association between PA level and arterial stiffness in Korean office workers. This study evaluated 487 male and 325 female Korean office workers who visited a Seoul-City Hall in Seoul, Republic of Korea and signed a written informed consent form. PA level and pulse wave velocity were measured. PA level was assessed by using the International Physical Activity Questionnaire (IPAQ) (5-6) as follows: (a) walking (metabolic equivalents of task [MET]·min·week⁻¹) = 3.3 × walking minutes ×

walking days; (b) moderate PA (MET·min·week⁻¹) = 4.0 × moderate PA minutes × moderate days; (c) vigorous PA (MET·min·week⁻¹) = 8.0 × vigorous PA minutes × vigorous days; (d) total PA (MET·min·week⁻¹) = walking + moderate PA + vigorous PA. Pulse wave velocity was determined by a pulse waveform analyzer (PV-1000, Colin-Co, Ltd., Komaki, Japan) according to the recommendations of Van Bortel et al. (7). No participants exercised regularly or had any health problems. Partial correlation coefficients were used to adjust for age and body mass index when analyzing the correlation between PA level and arterial stiffness. The level of significance was set at $P < 0.05$. All analyses were performed using SPSS version 18.0 (SPSS Inc., Chicago, IL, USA).

The baseline characteristics of the participants are presented in Table 1. PA was not significantly correlated with arterial stiffness in men ($r = 0.060$, $P = 0.189$) or women ($r = 0.047$, $P = 0.403$) (Table 2). Weekly sedentary time was not significantly correlated with arterial stiffness in men ($r = -0.055$, $P = 0.231$) but was significantly correlated with arterial stiffness in women ($r = 0.195$, $P < 0.001$).

The results of this study indicate PA is not correlated with arterial stiffness in either sex. However, weekly sedentary time is correlated with arterial stiffness in women but not men.

Table 1: Baseline characteristics of the participants

Variable	Male (n = 487)	Female (n = 325)	Total (n = 812)
Age (yr)	50.24 ± 5.87	36.30 ± 7.60	44.67 ± 9.51
Height (cm)	170.60 ± 5.43	159.65 ± 7.78	166.22 ± 8.41
Weight (kg)	71.73 ± 8.54	53.94 ± 6.59	64.61 ± 11.71
Body mass index (kg/m ²)	24.62 ± 2.42	21.45 ± 6.96	23.35 ± 5.02
Total physical activity (MET·min·week ⁻¹)	4113.87 ± 3898.10	4675.86 ± 5028.09	4338.80 ± 4391.12
Weekly sedentary time (min)	417.93 ± 179.31	641.67 ± 317.08	507.48 ± 267.33
Arterial stiffness (cm/s)	1303.64 ± 191.72	1308.50 ± 173.38	1305.58 ± 184.50

Data are mean ± standard deviation.

****P* < 0.001, partial correlation analysis adjusted for age and body mass index

Table 2: Partial correlations between physical activity and arterial stiffness in Korean office workers

Variables	Arterial stiffness (cm/s)			
	Male		Female	
	<i>r</i>	<i>P</i> -value	<i>r</i>	<i>P</i> -value
Physical activity (MET·min·week ⁻¹)	0.060	0.189	0.047	0.403
Weekly sedentary time (min)	-0.055	0.231	0.195	<0.001***

Acknowledgements

The authors declare that there is no conflict of interests.

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