

Interruption of sedentary behavior with intermittent physical activity mitigates hypercoagulation associated with prolonged sitting

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Sedentary behavior (SB) in post-menopause has been associated with an elevated cardiovascular risk, in particular venous thrombosis, regardless of physical activity (PA) levels. Interrupting SB with intermittent light-intensity or moderate to vigorous-intensity physical activity (LPA and MVPA, respectively) can avoid hypercoagulation associated with prolonged sitting. However, no studies examined this effect in free-living context using objectively measured SB and PA. This study was aimed to investigate the association between objectively measured SB patterns (i.e. duration and number of sedentary bouts) and hemostatic parameters. Fifty-two non-smoker post-menopausal women (age: 59.7 ± 6.2 yo; BMI: 27.3 ± 4.4) worn a multisensory device (Sensewear Armband, BodyMedia, Inc., Pittsburgh, PA) for at least three days to measure SB and PA. Blood samples were collected to measure hemostatic parameters. Data were log-transformed (log-) when non-normally distributed. Correlation was analyzed by Pearson's correlation coefficient, controlling for BMI, log-MVPA or total sedentary time (ST), depending on the need. Difference between women with daily SB bouts lasting at least 1 hr and women with shorter bouts was analyzed by Mann-Whitney U-test. Women were really active (102.5 ± 82.6 min/d MVPA) and with a large amount of SB (589.2 ± 132.5 min/d SB). Plasma fibrinogen was directly correlated with both ST and lying time, independently from BMI and log-MVPA ($r = .338$, $P = .016$; $r = .374$, $P = .007$) and inversely correlated with log-MVPA ($r = -.376$, $P = .006$). No correlation was found for sleep time. The number of bouts of SB lower than 5 or 10 min were not associated with fibrinogen, while the number of bouts of SB between 11 and 15, 11 and 20, and 21 and 30 min were directly correlated with plasma fibrinogen, regardless of BMI, ST, and log-MVPA ($r = .276$, $P = .05$; $r = .315$, $P = .028$; $r = .275$, $P = .05$, respectively). Furthermore, women with daily uninterrupted SB longer than 1 hr had higher plasma fibrinogen than other participants (323.9 ± 41.4 mg/dl; 287.7 ± 48.8 mg/dl, respectively; $Z = -2.53$, $P = .011$). In conclusion, uninterrupted SB is associated with adverse fibrinogen levels, regardless of ST and PA, while shorter bouts of SB are not directly associated with it. These results suggest that activity breaks mitigate the procoagulant effects of uninterrupted sitting, in post-menopausal women.

Key words

Sedentary Behaviors, sitting interruption, hemostasis.