IMPACT OF SEX ON MACROVASCULAR ENDOTHELIAL FUNCTION DURING PROLONGED SITTING WITH A MILD HYPERCAPNIC ENVIORNMENT

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Introduction: Prolonged sitting (PS), defined as sitting for 2+ hours at a time, has been identified as an independent risk factor for cardiovascular disease. It has been well-documented that an acute PS bout can impair macro- and microvascular dysfunction in healthy young individuals. Recently, we reported that PS in mild hypercapnic environments (elevated CO2 concentrations equivalent to crowded areas such as offices or auditoriums) can further exacerbate these impairments in healthy young adults, and these impairments can be partially prevented by intermittent bouts of passive and active leg movements. Office workers are one of the largest sectors of the US workforce, and have been reported to be frequently exposed to PS with mild hypercapnic environments. Therefore, there is a need of study to examine if our previous findings can be seen in office workers. Additionally, it is crucial to investigate if there is any differential contribution of biological sex on these findings. The purpose of this study was to examine the impact of active and passive muscular contraction on macrovascular endothelial function during PS with mild-hypercapnic environment in middle-aged office workers, and further compare potential differences between sex. **Methods:** Healthy office workers (n=13, 6 males and 7 females, 39±4, 41±9, respectively) participated in three experimental visits and consisted of 2.5 h of prolonged sitting in a mild-hypercapnic environment (CO_2 = 1500 ppm): control (CON, no movement), passive (PASS, passive limb movement), and active (ACT, active limb movement). Brachial artery and popliteal artery endothelial function were measured pre- and post-sitting for all visits using flow-mediated dilation (FMD). **Results:** Following 2.5 h of sitting, ACT showed greater popliteal artery FMD compared to CON. Additionally, females exhibited a significant reduction in popliteal artery FMD in the CON but was preserved in males after PS. No changes in Brachial artery FMD after PS, and no sex difference was found. **Conclusion:** PS significantly reduces leg vascular function in middle-aged office workers. Additionally, females showed greater reduction in leg vascular function compared to males. We conclude that uninterrupted prolonged sitting may induce a greater impairment on leg vascular function in females, indicating that this population may be at a greater risk compared to males. Additionally, intermittent bouts of active movement required to preserve leg vascular function during bouts of PS.