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Brachial Artery Low-Flow-Mediated Constriction (L-FMC) is Augmented in Older Women

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Endothelial dysfunction is a key component of vascular aging and increases the risk for cardiovascular disease (CVD). Women experience significant attenuations in vascular function as they age, which is exacerbated following menopause. Vasoconstrictor responses to low-flow conditions such as forearm ischemia may provide novel insights into vascular function that complement the vasodilatory responses assessed via flow-mediated dilation (FMD). However, little is known about the effects of aging on vasoconstrictor reactivity during an ischemic stimulus and the relationship between constrictor/dilator reserve, especially in women. **PURPOSE:** To compare vasoconstrictive responses to forearm ischemia between young and older women in addition to the traditional FMD. **METHODS:** Vascular responses to 5-min forearm ischemia were assessed in a convenience sample of 18 young (22.3 y) and 18 older women (69.6 y) via brachial artery low-flow-mediated constriction (%L-FMC), defined as $[(\text{nadir diameter during last 30 s of occlusion} - \text{baseline diameter})/\text{baseline diameter}] * 100$, %FMD, defined as $[(\text{peak post-occlusion diameter} - \text{baseline diameter})/\text{baseline diameter}] * 100$, and total vasoreactivity via modified FMD (%mFMD), defined as $[(\text{peak post-occlusion diameter} - \text{nadir diameter during last 30 s of occlusion})/\text{nadir diameter during last 30 s of occlusion}] * 100$. **RESULTS:** Older women had significantly augmented %L-FMC (-2.97% 3.01 vs. -0.76% 1.29, $p = 0.0072$) as compared to young women. %FMD and %mFMD were significantly higher in young women (9.32% 3.37 vs. 3.34% 3.20, $p < 0.0001$ and 10.18% 3.63 vs. 6.41% 4.30, $p = 0.0075$, respectively) as compared to older women. **CONCLUSION:** Older women experience increased vasoconstrictor responses to low-flow conditions as compared to young women, which may further contribute to age-related attenuations in vasodilatory response.

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