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Perspective

Yoga and Arterial Stiffness: A New Perspective on Flexibility

Stacy D Hunter *

Department of Clinical Exercise Physiology, University of Texas, Texas, USA

DESCRIPTION

Stiffening of the large central arteries occurs with advancing age and precludes the development of overt cardiovascular disease (CVD). Arterial stiffening compromises the ability of the vessel to buffer cardiac pulsations and leads to exposure of the vascular beads to high stress and increasing blood pressure. Both endurance and strength training have been examined as potential mediators of vascular function with endurance training exhibiting a lowering effect and strength training demonstrating no effect or an increase in arterial stiffness in middleaged and older adults. Although the effects of endurance and strength training on arterial stiffness have been well documented, the impact of flexibility on the vasculature has only recently emerged as a topic of interest. Yoga is an ancient mind-body practice originating in India thousands of years ago consisting of eight limbs, of which three: asana (posture); pranayama (breathing); and dhyana (meditation), have become increasingly practiced in the western world. In the U.S., Hatha yoga, the physical practice combining asana and pranayama, is most common. Yoga postures consist primarily of stretching and isometric exercises and are designed to improve flexibility, strength, balance, and focus. Therefore, yoga can be thought of as a form of flexibility training which could serve as a stimulus for vascular adaptation. The relationship between yoga and vascular function was first examined in 2008 when a cross-sectional study demonstrated a lowering effect of yoga on arterial stiffness comparable to that of aerobic exercise. In contrast, a subsequent cross-sectional study found no effect of yoga on arterial stiffness. . A potential explanation for this discrepancy is the variation in study design. In the aforementioned study, the yoga, endurance trained, and sedentary groups were not matched for body mass index (BMI) and yoga practitioners reportedly engaged in aerobic exercise, both of which could have impacted these findings as both exercise and BMI have been shown to affect arterial stiffness. The latter study limited their inclusion to yoga practitioners who did not regularly engage in other forms of exercise and matched the groups for BMI. Therefore, taken together, it appears that the previously shown lowering effect of yoga on arterial stiffness may have been partially due to confounding factors like habitual aerobic exercise or BMI. Interventional studies in young and older adults implementing different styles of yoga have yielded conflicting results. Both Dhyan and Bikram yoga have reduced arterial stiffness in young adults whereas Bikram and Ashtanga yoga failed to significantly alter this measure in middle-aged and older adults. Thus, it appears that yoga only reduces arterial stiffness in young adults. Perhaps accounting for these opposing results is a loss of vascular plasticity with age as previously indicated by a study which found that exercise-induced adaptations in leg vascular resistance after 8 weeks of training were limited to young adults with no changes observed in older subjects. Stretching is a central component of yoga postures which could serve as a stimulus for changes in arterial stiffness as evidenced by previously shown inverse associations between flexibility and arterial stiffness and enhancements in arterial compliance with 12 weeks of stretching in middle-aged adults . Given that currently no evidence suggests a beneficial effect of isometric exercise on arterial stiffness, the stretching component appears to be the primary factor driving the association between yoga and arterial elasticity. Physiological mechanisms accounting for the relationship between yoga and arterial stiffness remain unclear. However, potential mechanisms include possible sustained axial stretching of the arteries posing a stimulus for matrix reorganization which could lead to changes in arterial elasticity.

CONCLUSION

Yoga is an increasingly practiced alternative exercise mode with a large focus on flexibility. While the effects of traditional exercise on arterial stiffness have been well documented, more studies using evidence-based evaluation methods are needed to understand the potential impact of various types of hatha yoga on indices of vascular function in various age groups. Existing evidence suggests that yoga may be beneficial in enhancing the elasticity of the arteries in young adults.

Correspondence to: Stacy D Hunter, Department of Clinical Exercise Physiology, University of Texas, Texas, USA; E-mail: stacy.d.hunter@gmail.com

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