

## Can Deep Water Exercise Training Improve Arterial Stiffness in Women with Metabolic Syndrome?

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Metabolic syndrome (MetS) is associated with an increase in cardiovascular (CV) mortality, partially due to arterial stiffening, which can be measured non-invasively via pulse wave velocity (PWV). Arterial stiffness is a clinically relevant CV marker of mortality; an increase in PWV by only 1 SD is associated with an increase of CV risk by 15%. We tested the hypothesis that 8 weeks, 3 days per week, of deep-water exercise can lower the PWV in individuals with MetS. **Purpose:** To determine whether exercising in deep water, aquatic environment can effectively lower PWV in women with MetS and how that compares to changes in PWV with land based exercise. **Methods:** 10 women (age=58±5) were recruited to participate in the study. Carotid to femoral PWV was measured using applanation tonometry; radial artery waveforms were used for pulse wave analysis and to calculate central pressures. **Results:** Aquatic exercise significantly lowered PWV by 0.53 m/s ( $p \leq 0.05$ ). Other significant changes observed were BMI ( $p=0.03$ ) from 33.5±1.5 to 32.9±1.5, blood glucose ( $p=0.01$ , from 110±8 to 101±7), insulin ( $p=0.02$ , from 20±2 to 14±1), insulin resistance ( $p=0.01$ , from 5.39±0.81 to 3.55±0.50), augmentation index ( $p=0.05$ , from 25±2 to 22±2), and aerobic capacity ( $p=0.02$ , from 15.9±1.3 to 17.8±1.7). **Conclusion:** These findings indicate that the introduction of deep-water exercise positively influences the PWV. This decrease in PWV portends improvements in overall CV health and it may be useful in managing other CV related diseases. Much of the data showed significant improvement in clinical measures and this illustrates the efficacy of deep-water exercise. While the benefits of land based exercise have long been well known, these findings indicate that aquatic based exercise is also a very effective method for improving CV health.

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