The Effects of Venous Pooling During Prolonged Sitting on Central Arterial Stiffness

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METHODS
Study Design
• Randomized cross-over trial

Participants
• 15 Participants
  • 25.1 ± 6.2 years, 40% Female

Independent Variables
• 2 Conditions:
  • Cuff – bilateral occlusive cuffs placed above the knees
  • Non-Cuff – control condition

Dependent Variables
• Calf Circumference
• Brachial-femoral Pulse Wave Velocity

RESULTS
• bfPWV
  • Percent Change Over Time: 96.4% increase
  • Main Effect (Time): \( \beta = 0.3150, p=0.023, \) Effect size: 0.428
  • Venous Pooling via Calf Circumference
  • Cuff Condition: 3.2% increase
  • Non-Cuff Condition: 0.6% increase
  • Interaction Effect: \( \beta = -0.987, 95\% \text{ CI} = -1.493 \) to \(-0.480, \) Effect Size: 1.98

OBJECTIVE
To determine the effect of venous pooling manipulation on central AS.

TAKE HOME
Venous pooling was successfully induced in the cuff condition versus the non-cuff condition. bfPWV increased over time in both conditions, suggesting that venous pooling does not influence arterial stiffness.

PROBLEM
Increases in arterial stiffness (AS) are associated with increased cardiovascular disease (CVD) risk. During prolonged sitting, AS increases. However, the mechanism for increased AS during prolonged sitting is unclear.

FIGURE 1. Linear mixed model results for brachial-femoral pulse wave velocity.

FIGURE 2. Linear mixed model results for venous pooling via calf circumference.

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**This presentation was made possible by the Office of Undergraduate Research at the University of North Carolina at Chapel Hill travel award