TACSM Abstract

Relationship Between Arterial Stiffness and Cerebral Vascular Reactivity in College-aged African Americans

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ABSTRACT

African Americans (AA) have increased risk for cardio and cerebral vascular disease relative to Caucasians (CA). While is it generally accepted that arteries become stiffer at a younger age in AA; less is known regarding cerebral vascular function / reactivity (CVMR) to hypercapnia in AAs. Furthermore, to our knowledge, little is known regarding the relationship between arterial stiffness and CVMR, particularly in young healthy adults. We tested the hypothesis that AAs have elevated arterial stiffness and reduced CVMR during hypercapnia relative to CAs. Furthermore, we hypothesized that there would be a negative relationship between arterial stiffness and CVMR. In 7 AA and 13 CA subjects central arterial stiffness was indexed from carotid-femoral pulse wave velocity (PWV). CVMR was assessed by the cerebral vascular conductance (CVC) response to rebreathing induced hypercapnia. PWV was elevated in the AAs (AA: 564±54 cm/ms vs. CA: 482±73 cm/ms; P=0.02). CVMR was also significantly reduced during hypercapnic rebreathing in the AAs (AA: 2.7±0.7 % / Torr vs. CA: 4.0±1.1 % / Torr; P=0.01). When data from all subjects was included there was a negative relationship between PWV and CVMR such those with elevated stiffness had an attenuated increase in CVC during hypercapnia (P=0.02). These data indicate that AAs have impaired cerebral vascular responses to hypercapnia and that this might be related to stiffer arteries.