PO-29: CREATION OF A FIXED CENTRAL ARTERIAL-VENOUS ANASTOMOSIS ON ARTERIAL STIFFNESS AND CENTRAL HAEMODYNAMICS: A TREATMENT FOR HYPERTENSION TARGETING THE PHYSICAL PROPERTIES OF THE ARTERIAL VASCULATURE

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IN CHRONIC STROKE headache in obesity requires further study. Microcirculation contributes to the development of tension-type or migraine with tension-type headache but not migraine in obese middle-aged/older adults.

Conclusions: Middle-aged/older obese adults who were stratified (via detailed survey and physical exam by a neurologist) by presence of migraine (n = 39; age 54 ± 6 yrs, BMI 38 ± 6 kg/m², 67% female), tension-type headache (n = 25; age 57 ± 6 yrs, BMI 37 ± 4 kg/m², 72% female) or no headache of any type (n = 29; age 54 ± 7 yrs, BMI 37 ± 5 kg/m², 48% female) had aortic stiffness (carotid-femoral pulse wave velocity, CFPWV), brachial and central BP, and central AI and AP assessed by planimetry (Sphygmocor).

Results: Obese adults with tension-type headache, but not migraine (P = 0.29), demonstrated higher AI (25.4 ± 9.6 vs. 17.8 ± 6.9%, P = 0.02) and AP (11.7 ± 9.6 vs. 6.8 ± 6.6 mmHg, P = 0.01) compared with no headache controls, but no difference in CFPWV between the 3 groups (P = 0.47). After adjusting for age, mean BP, female sex, weight, height, and antihypertensive medication, higher AP (β = 2.95, P = 0.04) and AI (β = 4.41, P = 0.07) remained associated with greater frequency of tension-type headache.

Conclusions: Higher central AI and AP, but not aortic stiffness, is associated with tension-type headache but not migraine in obese middle-aged/older adults. Whether excessive penetration of pulsatile pressure into cerebral microcirculation contributes to the development of tension-type or migraine headache in obesity requires further study.

PO-28 CHANGES IN CEREBROVASCULAR PULSATILITY DURING AEROBIC EXERCISE ARE UNRELATED TO BRACHIAL-ANKLE PULSE WAVE VELOCITY IN CHRONIC STROKE

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Arterial stiffness contributes to increased cerebral hemodynamic pulsatility and independently predicts negative outcomes post-stroke. Exercise can contribute towards recovery after stroke, yet it is unclear whether arterial stiffness influences acute cerebrovascular responses to exercise. One study in healthy young men showed high-intensity resistance exercise increased stiffness influences acute cerebrovascular responses to exercise. One study in healthy young men showed high-intensity resistance exercise increased stiffness and pressure pulsatility up to 30 minutes post-exercise without affecting cerebral hemodynamics (1). The influence during acute aerobic exercise, however, is unknown.

Objectives: To investigate the association of arterial stiffness with changes in pulse pressure (PP) and middle cerebral artery pulsatility index (PI) during aerobic exercise in chronic stroke adults. We hypothesized that resting brachial-ankle pulse wave velocity (baPWV) would be associated with greater exercise-related increases in PP and PI.

Methods: Participants were recruited 3 to 12 months post-stroke. BaPWV was quantified using applanation tonometry. A symptom-limited cardiopulmonary exercise test was conducted. Change in cerebral blood flow pulsatility during moderate intensity exercise appears to be independent of systemic arterial stiffness, although a larger sample is still necessary.

References

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Introduction: Current device based treatments for resistant hypertension target selective modification of the somatic, sympathetic, or parasympathetic nervous systems. The influence of the respective nervous systems on vascular stiffness and haemodynamics is unclear, and there is little data on the effect of current devices nor pharmacotherapy on arterial stiffness often associated with resistant hypertension. A novel device technology (ROX Coupler, San Clemente, CA) has been developed that causes an immediate, significant and sustained reduction of blood pressure by exploiting the mechanical effects of creation of a low resistance, high compliance venous segment to the central arterial tree. The Coupler creates a 4 mm diameter AV anastomosis between the iliac artery and vein.

To date no data exist on the effect of AV fistula placement on central haemodynamics and arterial stiffness. We present data on central pressure, and aortic pulse wave velocity (aPWV) from a 63yr old woman before and 4 months after AV fistula formation using the ROX Coupler device.

Methods: Peripheral blood pressure, central haemodynamics and carotid femoral pulse wave velocity (c-f PWV) were assessed (SphygmoCor AtCor Medical) before and 4 months after insertion of the ROX Coupler. Results are tabulated in (Table 1).

Results: aPWV decreased by 1.5 m/s from 15.2 to 13.7 m/s and MAP decreased by 17mmHg. Given that a 10mmHg reduction in MAP would produce an approximate reduction in aPWV of 0.5 m/s it would appear that the reduction in aPWV was in part blood pressure independent.

Conclusions: Insertion of the ROX Coupler was shown to produce a large reduction in aPWV which may not all be blood pressure dependent. These findings suggest that a mechanical solution to reduced arterial compliance may result in safe and effective lowering blood pressure, and address a mechanism of persistent hypertension unapproached by current therapy. Haemodynamic measurements in larger numbers of patients undergoing ROX Coupler insertion will be necessary to confirm this physiology and better appreciate its potential role in the prevention and treatment of the cardiovascular complications of hypertension.

PO-30 CAROTID STRAIN DOES NOT EXPLAIN SEX DIFFERENCES IN BLOOD PRESSURE

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Objective: Women have a lower incidence of cardiovascular morbidity and mortality prior to menopause when compared to age-matched men. However, the mechanisms behind the differences in blood pressure is unknown.