4.5: THE EFFECT OF LUNG FUNCTION ON BLOOD PRESSURE AND VASCULAR INDICES FROM ADOLESCENCE TO EARLY ADULTHOOD IN A MULTI-ETHNIC COHORT

Yao Lu, Harding Seeromanie

To cite this article: Yao Lu, Harding Seeromanie (2017) 4.5: THE EFFECT OF LUNG FUNCTION ON BLOOD PRESSURE AND VASCULAR INDICES FROM ADOLESCENCE TO EARLY ADULTHOOD IN A MULTI-ETHNIC COHORT, Artery Research 20:C, 57–57, DOI: https://doi.org/10.1016/j.artres.2017.10.043

To link to this article: https://doi.org/10.1016/j.artres.2017.10.043

Published online: 7 December 2019
4.4 MIDDLE CEREBRAL ARTERY PULSATILITY IN HEART FAILURE AND PATIENTS WITH CONTINUOUS-FLOW LEFT VENTRICULAR ASSIST DEVICES

Eric Stöhr 1, Francesco Castagna 1, James Pearson 2, Laura Watkeys 3, Samuel Trocio 1, Oksana Zatvarska 1, Timothy Crimmins 1, Reshad Garan 1, Veli Topkara 1, Hiroo Takayama 1, Koji Takeda 1
1Columbia University Irving Medical Center, USA
2University of Colorado at Colorado Springs, USA
3Cardiff Metropolitan University, UK

Background: High pulsatility index (PI) in the cerebral circulation has been associated with increased prevalence of stroke (1). Interestingly, heart failure (HF) patients implanted with continuous-flow left ventricular assist devices (CF-LVADs) have increased rates of stroke despite presenting with dramatically lower pulse pressures compared with healthy individuals (20 mmHg vs. 30–40 mmHg). Characterising and understanding flow velocity profiles of the middle cerebral artery (MCA) may provide a useful and local marker of pulsatile energy transmitted into the brain of HF and CF-LVAD patients.

Methods: PI and resistance index (RI) were quantified from Duplex ultrasound images (2D and pulsed-wave Doppler) of the MCA obtained in four heart failure patients (HF; 68 ± 7 yrs), eight CF-LVAD patients (59 ± 4 yrs) and 20 healthy controls (51 ± 7 yrs).

Results: Compared with healthy controls, PI of the MCA was actually higher in the HF group (0.72 ± 0.16 vs. 1.32 ± 0.17, P < 0.0001), but markedly lower in patients on CF-LVAD (0.36 ± 0.21, P < 0.0001). However, RI was similar between healthy controls and HF patients (P > 0.05), and only lower in CF-LVAD patients (P < 0.0001).

Conclusions: PI in the MCA is significantly higher in HF but markedly lower in CF-LVAD patients, relative to healthy controls. The higher PI in HF does not appear to be associated with an altered RI. Future work should examine the cerebrovascular outcomes associated with varying levels of pulsatility and resistance in both HF and CF-LVAD patients.

Reference

4.5 THE EFFECT OF LUNG FUNCTION ON BLOOD PRESSURE AND VASCULAR INDICES FROM ADOLESCENCE TO EARLY ADULTHOOD IN A MULTI-ETHNIC COHORT

Yao Lu 1, Harding Seeromamie 2
1The Third Xiangya Hospital of Central South University, China
2King’s College London, UK

Given the significance of lung function (LF) for vascular health in adulthood, there are surprisingly few studies that have examined the interrelationships of their developmental trajectories. Both develop and decline over the life course, though LF peaks in the 20s, and both predict cardiovascular events and mortality. We used the multi-ethnic Determinants of Adolescent Social well-being and Health (DASH) longitudinal study to test whether lung function (LF) from early adolescence to young adulthood affected vascular indices. In 2002–3, 6643 11–13 y olds from 51 London schools participated at baseline, and 4785 were seen again at 14–16 y. Recently 665 participated in pilot follow-up at 21–23 y. Regression models examined relationships between Forced Expiratory Volume (z-scores for zFEV1, derived using Global Lung Initiative equations), blood pressure (BP), aortic pulse wave velocity (PWV) and augmentation index (Alx), the latter measured only at 21–23 y. At 11–13 y, z-score zFEV1 was associated with a 1.90 mmHg (95% CI 1.17–2.68, p < 0.001) in systolic BP. In contrast at 21–13 y, a relationship between these measures was not evident. Between 11–13 y and 21–23 y, z-score change in zFEV1 was associated with a 1.38 mmHg (0.25–1.51, p < 0.05) SBP, adjusted for age, sex, ethnicity, waist-height ratio, employment, and reported racism, smoking and alcohol use. zFEV1 at 11–13 y or 21–23 y was not associated with PWV or central Alx (Alxao) at 21–23 y. These findings signal that whilst cross-sectionally LF is differentially associated with SBP in early adolescence than in the 20s, longitudinal change in LF is positively associated with changes in SBP during this part of the life course.