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Abstracts

P6.12
WAVE INTENSITY ANALYSIS OF REFLECTIONS IN THE BRACHIAL ARTERY FOLLOWING CUFF OCCLUSION AND HAND WARMING

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Background: Wave intensity analysis (WIA) is a mathematical tool used to study wave reflections in the arteries. Reflections are believed to contribute to BP augmentation and are also independent predictors of cardiovascular risk. Until now, the use of this technique has been largely confined to the carotid and central arteries.

Methods: 8 healthy subjects (age 30±7.1) underwent wrist occlusion using a cuff inflated to >50mmHg suprasystolic pressure for 5min and hand warming at 55℃ for 12min. Brachial artery diameter and blood flow velocity were measured using wall tracking and doppler ultrasound with an ALOKA SSD-5550 equipped with a 7.5 MHz probe. Wave intensity was calculated and reflected waveforms using a zero-phase, low-pass, high-order Butterworth filter. This suggests that conventional PC-MR may produce erroneous results when data is acquired at low TR, as simulated using low-pass filtering. This indicates that conventional PC-MR may produce erroneous results when data is acquired at low TR, as simulated using low-pass filtering.

Results: Cuff inflation resulted in a significant increment in WRI from 12.4±4.1% to 26.8±8.34% (p<0.001) whereas a marked reduction from 16.3±6.6% to 4.0±1.62% followed hand warming (p=0.0017). Cuff release was immediately associated with a significant attenuation in WRI (p<0.01). Hand-warming had no significant effect on the contralateral brachial or aortic SBF or DBP compared to baseline (p=0.3, 0.08 respectively).

Conclusion: Radial artery occlusion and hand warming respectively led to an augmentation and reduction in the reflected wave in the brachial artery. Hand warming was not associated with a significant change in peripheral or central BP.

P6.13
ADULT GUIDE-LINES ARE NOT APPLICABLE TO MEASURE PWV PATH LENGTH IN PAEDIATRICS

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Aortic pulse wave velocity (PWV) is a sensitive marker of arterial stiffness in children. In our previous study we have presented reference tables for PWV normal values in children. A recent consensus document provides arguments for the use of 80% of the direct carotid femoral distance as the most accurate distance estimate in adults. In the present work we aimed to assess if a transposition of the adult PW measurement method is valid in childhood. Data of children participating to our previous work establishing age and height specific PWV normal values were re-evaluated. A total of 1008 healthy children (mean age:15.2 years, 495 males) were included in the study. We have recalculated PWV values using the subtractive method path length (L(SM)) and 80% of direct path length (L(0.8)). We have constructed Bland-Altman (BA) plots to assess the difference between PWV(SM) and PWV(0.8), and the distances L(SM) and L(0.8) in different age groups. The concordance between PWV(SM) and PWV(0.8) is excellent in children below 14 years (BA, ΔPWV mean:0.19 m/s, SD:0.40). However, in children >14 years, the difference increases (BA, ΔPWV mean:0.57 m/s, SD:0.36), and there is a proportional error between PWV(SM) and PWV(0.8) (BA, r=0.18; p<0.001), and in parallel there is also a proportional error between L(SM) and L(0.8) (BA, r=-0.24; p<0.001). The path length measurement suggested for adults may not be transposable to children throughout all age groups without reservation. Thus we propose to keep the current tables and values, unless the validity of a particular measurement is proved. (Grant: OTKA100909)