P2.17: THE REPRODUCIBILITY OF ARTERIAL STIFFNESS IN COPD

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Total arterial compliance is a main determinant of pulse pressure. For most part it resides in the aorta, where also major changes take place, which may differ locally. To follow local changes in aortic compliance, as in aging, noninvasive determination (area change deltaA) and flow were determined at 6 aortic locations. Simultaneously brachial blood pressure (BP) was measured with cuff. Aortic arch pressure AAP was calculated by setting diastolic and mean pressure equal [1]. Regional aortic pressures were estimated from AAP using (averaged) literature data on aortic pressure transfer [2,3]. Regional aortic compliance was then calculated in two ways, the pulse pressure method [4] and local area compliance (deltaA/deltaAP) times segment length.

Studies were carried out in 7 healthy volunteers. The PPM of the AA includes head vessels while the area method does not, thus allowing compliance calculation of head vessels. Of the total arterial compliance, ascending to distal arch contributes (segments 1-3) 40%, descending aorta (segments 4&5) 25%, head/arms 15%, legs 20%.

Regional aortic compliance can be obtained non-invasively and thus allows following changes in local compliance (e.g., age, effects). Compliance from local Pulse Wave Velocity should be compared but requires diameter information.


P2.15
VALIDATION OF CENTRON CBP301 VERSUS SYPHGMOCOR WITH A MODIFIED ESH-IP 2010 PROTOCOL

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Centron cBP301 (Centron Diagnostics, UK) is a new cuff-based central blood pressure meter. It estimates central systolic pressure (cSBP) from the oscillometric brachial cuff waveforms with a specific generalized transfer function [1]. To date, there is no specific international protocol to validate non-invasive central pressure measurements. So we modified the internationally accepted ESH-IP2010 protocol for electronic arm cuff-based device to validate the Centron cBP301[2]. We used Sphygmocor (AtCor; Australia) as reference.

Radial tonometric Sphygmocor measurements were done 4 times alternated with 3 Centron cBP301 measurements. Each Centron recordings were compared with the most favorable Sphygmocor recordings done immediately before or after and calibrated with Centron peripheral SBP and DBP measurements.

40 subjects (25 men, 15 women) from the Centre de Diagnostic et de Thérapeutique (Hôtel-Dieu, Paris) were recruited. Seventeen had a peripheral DBP <90 mmHg, 17 between 90-100 mmHg and 6 with a DBP >101 mmHg. Eleven had a peripheral SBP <129 mmHg, 16 between 130 and 160 mmHg and 13 with SBP >161 mmHg. Central SBP varied between 86 and 176 mmHg (mean±SD: 131±23). Mean heart rate was 70±16 bpm. Mean error on central SBP was 0.91±3.10 mmHg with 87.5% of the measurements falling within 5 mmHg and 100% within 10 mmHg.

Despite the fact that 4 subjects with DBP above 101 mmHg are missing for the accomplishment of the ESH-IP BP recruitment criteria, the Centron cBP301 device fulfills the pass criteria for estimating central SBP.

2. O’Brien et al., P. BloodM. ressonit 2010