Tracking of Central Aortic Systolic Blood Pressure Over the Entire Life Course

Poster Contributions
Hall C
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Background: Recent studies clarify the tracking of brachial cuff systolic pressure from infancy to adolescence [1,2], and early adulthood to old age [3] (figure).

Methods: From these three blood pressure studies [1-3], we estimated Aortic Systolic Pressure (ASP) from their respective cuff brachial values. To calculate ASP, we applied a validated generalized transfer function in a normal adult population for >18 years [4], and “second systolic shoulder” method from a normal pediatric population [5] for children up to age 18 years [6], using their published radial artery waveforms; near-identity of both has been established [7]. Neonatal pressure were based on invasive measurements [8].

Results: While there was no difference between ASP and brachial systolic pressure in neonates, this became apparent by age of 4 years, and extreme at 18 years when ASP was 15-20 mmHg less than brachial. There was no gender difference between ASP up to age 14, when ASP was higher in males, as was brachial pressure. This was related to continued growth in males.

Conclusions: Findings indicate that ASP increases progressively throughout life, with the major differences from brachial values attributable to bodily growth, and variable distortion in the pulse wave during transmission from aorta to periphery in the upper limb. Gender differences become apparent in adolescence, and lessen subsequently. At the extremes of age, there are no gender-differences in systolic pressure between aorta and brachial artery.