



P37 Increased Pressure Dependency of Pulse Wave Velocity with Age

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ABSTRACT

Background: Arterial stiffness, as measured by pulse wave velocity (PWV) is dependent on arterial blood pressure but whether this dependence varies with age is unknown. The objective of this study was to determine to what degree pressure-dependence varies with age.

Methods: 83 healthy (43 females) normotensive volunteers from three different age groups (young: 18–30, middle aged: 31–55, older: 56–70 years) were recruited for this study. Aortic PWV (aPWV) was measured at different level of aortic transmural pressure (aTMP). aTMP was calculated as difference between mean arterial pressure and mouth pressure (which is almost equal to intrathoracic pressure). Acute modulation of aTMP was achieved by performing respiratory manoeuvres (Valsalva and Muller manoeuvres) against a mouthpiece with a small leak.

Results: aPWV was higher in older compare to younger subjects (6.6 ± 1.4 vs 5.3 ± 0.9 m/s, $p < 0.001$). Changes of aTMP in response to respiratory manoeuvres were similar across all age groups. However, changes of aPWV induced by acute modulation of aTMP were age-dependent, with aPWV increasing by 1.7 m/s per 10 mmHg increase in aTMP in older subjects compared to 0.4 m/s per 10 mmHg of aTMP change in younger subjects ($p < 0.001$).

Conclusion: Pressure-dependence of aPWV increases with age. This may contribute to the age related increased in aPWV and, if reversible, have important implications for therapeutic lowering of PWV through anti-hypertensive treatment.

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