

Conference Abstract

YI 2.2 Spontaneous Cardiovascular Ageing of C57BL6 Mice Results in the Development of Aortic Stiffness Prior to Peripheral Blood Pressure Alterations

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Keywords

Arterial stiffness
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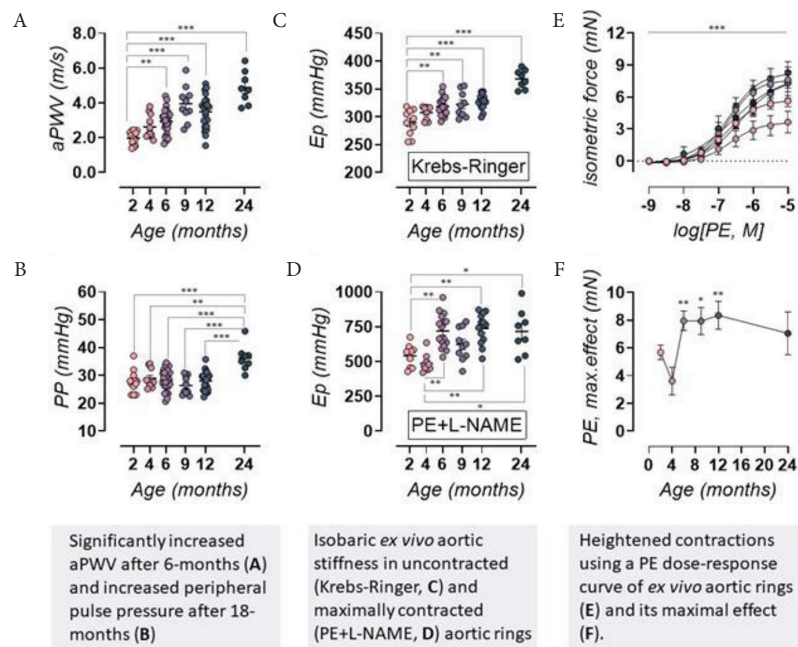
ABSTRACT

Background: Although generally assumed to be an adaptive response to increased blood pressure (BP), arterial stiffness is now recognized as an independent predictor of cardiovascular (CV) events [1]. Moreover it precedes hypertension in at least two mouse models [2,3]. Therefore, the present study aims to investigate the temporal development of aortic stiffening and peripheral blood pressure (BP) alterations in spontaneously ageing mice.

Methods: A longitudinal cardiovascular characterization of spontaneously ageing C57Bl6 mice (2, 4, 6, 9, 12 and 24-month old) (male, $n > 8$) was performed. This includes *in vivo* analysis of peripheral BP (Coda) and aortic pulse wave velocity (aPWV, Vevo2100), combined with *ex vivo* aortic studies of isometric reactivity (organ baths) and aortic stiffness measurements (Peterson modulus, Ep) in the Rodent Oscillatory Tension set-up for Arterial Compliance (ROTSAC).

Results: *In vivo* and *ex vivo* characterisation confirms that aortic stiffness precedes peripheral BP alterations in spontaneously ageing C57Bl6 mice, with significantly increased aPWV from 6 months of age (Figure A), whereas peripheral BP measurement only shows elevated pulse pressure in 24-month-old mice (30% increase vs. all other ages, Figure B). *Ex vivo* investigation of the thoracic aorta further reveals that the aortic stiffening is both contraction-independent (Figure C) and dependent (Figure D), since older mice display increased contractions to phenylephrine (PE) (Figure E and F).

Conclusion: Spontaneously ageing C57Bl6 mice present with significant aortic stiffness by 6-months of age, which is both contraction-dependent and independent in origin. Aortic stiffness thereby precedes the development of peripheral BP alterations by 18 months.



Figure

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