

P46 Haemodynamics Determinants of Central Pressure during Systole

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ABSTRACT

The influence of arterial and ventricular parameters on the main fiducial pressure points and index during systole has been investigated using a mix of *in silico* and *in vivo* data. Notably, an index, QIx, based entirely on ventricular ejection patterns has been developed and its potential in describing the augmentation pressure index, AIx, has been investigated and compared against the reflection coefficient Γ . In a group of hypertensive patients ($n = 156$) and in healthy volunteers whose physiology was modulated via administration of vasoactive drugs ($n = 13$), QIx was found to be more correlated to AIx than Γ (coefficient of determination, $R^2 = 0.71$ vs $R^2 = 0.53$ in the normotensive group; $R^2 = 0.52$ vs $R^2 = 0.37$ in the hypertensive group). This trend was confirmed by a LASSO analysis on *in vivo* data (standardised coefficient, $\beta = 0.42$ vs $\beta = 0.22$, $p < 0.001$ in both cases) and also observed in an *in silico* sensitivity analysis on a reduced 7-artery model of the upper aortic arch (for variations between -25% and $+25\%$ of QIx and Γ from baseline values, AIx varied between -245% and $+193\%$, -194% and $+191\%$ respectively) (Figure 1). All analyses were also concordant for the main determinants of the first systolic shoulder P1 and augmentation pressure AP: pulse wave velocity ($\beta = 0.74$, $p < 0.001$) and peak flow velocity ($\beta = 0.41$, $p < 0.001$) are the main determinants of P1 while reflection waves ($\beta = 0.34$, $p < 0.001$) and stroke volume ($\beta = 0.37$, $p < 0.001$) mainly define AP (Figure 1). These results further strengthen the case that ventricular dynamics is at least as important as arterial stiffening in raised pulse pressure.

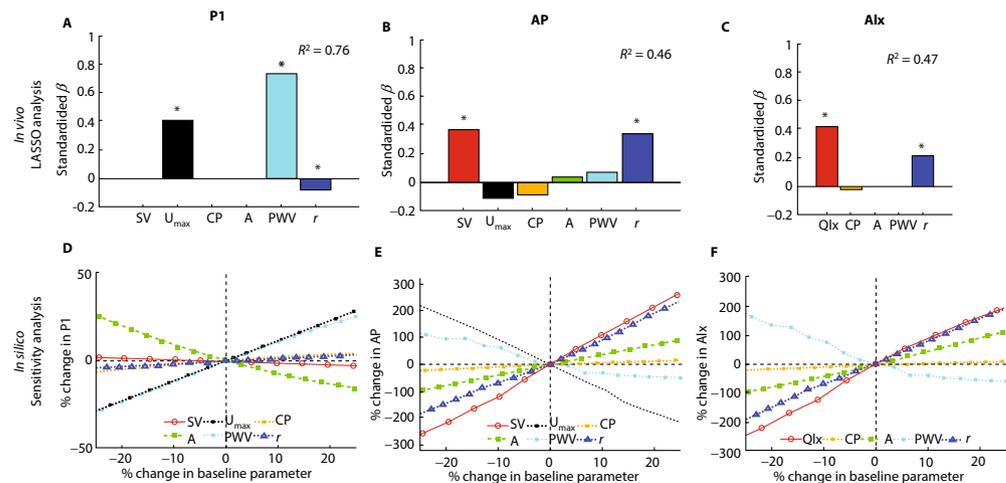


Figure 1

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