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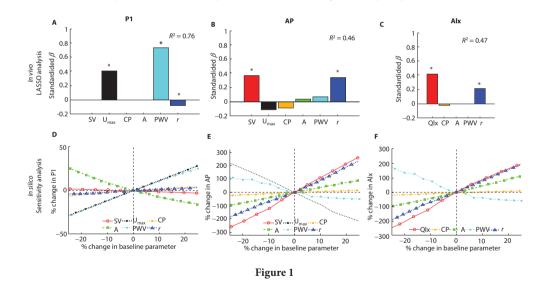
P46 Haemodynamics Determinants of Central Pressure during Systole

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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 silicosensitivity 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 ($\beta = 0.34$, 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.



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