Assessment of systolic aortic pressure and its association to all cause mortality critically depends on waveform calibration.

The aim of this study is the prospective investigation of the association of brachial SBP (bSBP) and aortic SBP (aSBP) to all-cause mortality, with special emphasis on different calibration methods for central pressure estimates, in particular, brachial systolic and diastolic, as well as brachial mean and diastolic pressures. One hundred and fifty-nine patients were enrolled in a longitudinal, prospective study of arterial stiffness and cardiovascular risk in a chronic kidney disease stages 2-4 cohort. Office measurements of bSBP and aSBP were assessed by a validated oscillometric device. Prognostic factors of survival were identified by use of Cox proportional-hazards regression models. After a mean follow-up duration of 42 months (range 30-50 months), 13 patients died. In univariate Cox analysis, bSBP and aSBP calibrated using bSBP and bDBP did not significantly predict mortality, only aSBP assessed using measured mean and diastolic pressure calibration was significantly associated with mortality (hazard ratio 1.027, P = 0.008). This remained significant in multivariate analysis after adjustment for age, sex, and anthropometric measures. More important, adding bSBP to the multivariate model (hazard ratio 0.91, P = 0.003) lead to a significantly increased prognostic power of aortic systolic pressure (hazard ratio 1.097, P< 0.001) and indicated that
differences between bSBP and aSBP are of potential interest. Within our cohort, only aSBP assessed with measured mean and diastolic pressure independently predicted mortality and provided additional prognostic value on top of bSBP readings. Therefore, the method of calibration plays an important role for predictive power of aSBP.

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