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Predictive value of pulse wave velocity on the risk of end-stage renal disease

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Objectives: Arterial stiffness is a great concern in relation to high mortality. However, the predictive value of pulse wave velocity, one of assessment tools for arterial stiffness, on the risk of end-stage renal disease (ESRD) remains unresolved.

Methods:

A total of 9,139 patients who measured cardio-ankle vascular index (CAVI) were included in the study. Patients were divided according to the median value or the quartiles of CAVI. The hazard ratios (HRs) of ESRD and all-cause mortality were calculated using the Cox model.

Results: During the median follow-up period of 7 years (maximum 12 years), the events of ESRD and mortality occurred in 228 and 1,122 patients, respectively. The median value of CAVI was 8.5. The high CAVI group (> 8.5) had a higher risk of ESRD than the low CAVI group (HR, 1.6 [1.23–2.12]; $P = 0.001$). The risk of all-cause mortality was also higher in the high CAVI group than in the low CAVI group (HR 1.7 [1.47–1.90]; $P < 0.001$). When the analysis were stratified by the value of 10, the higher than 10 of CAVI was related with the risk for ESRD and mortality as following HRs: 1.7 [1.17–2.45] in ESRD; and 2.3 [1.95–2.64] in mortality. Although the analysis was performed based on the quartiles, the 4th quartile group had a higher risk of ESRD (HR, 2.3 [1.53–3.33]; $P < 0.001$) than the 1st quartile group. The risk of all-cause mortality was also higher in the 4th quartile than in the 1st quartile (HR, 2.1 [1.75–2.48]; $P < 0.001$).

Conclusions:

The measurement of arterial stiffness by pulse wave velocity may be needed to predict the risk of ESRD.