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Association between arterial stiffness and vascular related diseases: The best study

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Background: Arterial stiffness has been confirmed of its predictive value on cardiovascular diseases and the many parameters that could reflect arteriosclerosis. However, very few studies evaluated the condition of arteries in patients with various cardiovascular diseases and the combined influences on vascular function. The present study was designed to explore the association of arterial stiffening reflected by two different parameters in participants exposed to combined vascular related diseases from China.

Methods: A total of 12576 participants were enrolled in the study, between the years 2010–2016, with 6041 males and 6535 females (mean age: 58.75 ± 13.23 years). All participants were analyzed according to the exposing and number of disorders such as hypertension, Diabetes Mellitus (DM), Coronary Artery Disease (CAD), stroke and Peripheral Artery Disease (PAD). Arterial stiffness was assessed by Carotid Femoral Pulse Wave Velocity (CF-PWV) and Cardio-Ankle Vascular Index (CAVI). Age- and sex-adjusted analyses by covariance and regressions were used.

Results: Arterial stiffness reflected by CF-PWV and CAVI was significantly higher, and Ankle Brachial Index (ABI) was lower in patients with hypertension, DM, CAD, stroke and PAD compared with number of these diseases (all $p < 0.05$). CF-PWV and mean CAVI increased, mean ABI decreased gradually with the increase of the number of combined diseases, the β for each 1 increase were 0.404 m/s, 0.106 and -0.022, respectively (all $p<0.001$). With the increase in the number of diseases, the proportion for arterial stiffness reflected by CF-PWV >12 m/s, RCAVI > 9 or LCAVI>9 all increased, with a β for each 1 increase were 1.40, 1.26 and 1.22 ($p<0.001$).

Conclusions: In participants with hypertension, DM, CAD, stroke or PAD, the degree and proportion of arterial stiffness were higher. With the increase in the combined number of diseases, the degree and proportion for arterial stiffness increased. CAVI showed a similar effect as CF-PWV in various vascular related diseases.

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