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Clinical value of measuring central blood pressure in hemodialysis patients

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Objectives : Many investigators suggest that central blood pressure is more clinically relevant than brachial blood pressure. High central blood pressure causes vascular wall stress in peripheral vasculature such as cerebral and coronary arteries and accelerate atherosclerosis. In this study we aimed to investigate the clinical value of central blood pressure as a predictor of arterial stiffness in hemodialysis patients.
Methods : Central blood pressure was measured using applanated arterial tonometry (HEM-9000AI, Omron, Japan) For PWV measurement, Patients lie down, rest for at least 5 minutes, and prohibit smoking and coffee for 3 hours before the measurement. BaPWV is measured by recording pulse waves of both arm and both ankles from the pressure signal obtained by measuring 4-extremitiy blood pressure.
Results : One hundred patients were included, of whom 51 (50.5%) were men. The median age was 66 years (interquartile range 58-76 years). The median vintage of hemodialysis was 47.5 months (range 31.3-89.1 months). There were no significant differences between high pulse pressure group and low pulse pressure group in sex, hemodialysis vintage, end-stage renal disease etiology, and type of vascular access. However, the difference between central blood pressure and brachial blood pressure was greater in high pulse pressure group ($P = 0.03$). Both central and brachial pulse pressure showed a linear correlation with BaPWV ($r^2=0.610$, $P < 0.001$, $r^2=0.663$, $P < 0.001$, respectively). And difference between central and brachial blood pressure also showed linear correlation with BaPWV ($r^2=0.160$, $P=0.018$) Central blood pressure was significantly associated with BaPWV (hazard ratio [HR] 1.035; 95% CI 1.013-1.057, $P = 0.001$). After adjusting for age, sex and hemodialysis vintage, Central blood pressure was independently associated with BaPWV (hazard ratio [HR] 1.039; 95% CI 1.015-1.063, $P = 0.001$)
Conclusions : Central blood pressure may be suggested as an independent risk factor for arterial stiffness in hemodialysis patients.