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The Association among carotid IMT, PWV and vascular access failure in hemodialysis patients

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Objectives: Patients with chronic kidney disease (CKD) or end stage renal disease (ESRD) have an increased risk of cardiovascular mortality and morbidity. We aimed to compare the value of IMT with tests such as coronary CT and Pulse wave velocity(PWV) as predictors of cardiovascular risk in ESRD patients undergoing maintenance dialysis and examine their association with cardiovascular disease.

Methods: We reviewed the participants' medical records, including height, weight, medication history, etiology of ESRD, HD vintage, and blood pressure which were measured during hemodialysis. Carotid doppler was performed by an experienced radiologist who are unaware of the aims of the study and blinded to the laboratory findings. 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 arms and 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 IMT group and low IMT group in sex, hemodialysis vintage, end-stage renal disease etiology, and type of vascular access. However, age was significantly older in the high IMT group. IMT was significantly associated with PWV. (hazard ratio [HR] 2.109; 95% CI 1.037-4.291, $P = 0.039$). After adjusting for age, sex and presence of diabetes, IMT was independently associated with PWV (HR 2.110, 95% CI 1.036-4.298, $P = 0.040$). The risk of recurrent vascular access failure was higher in the high IMT group (HR 1.615, 95% CI 1.460-5.669, $P = 0.034$).

Conclusions: IMT was associated with PWV and recurrent access failure. Thus IMT may be suggested as a potential predictor of vascular access failure.