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Dialysis

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Vascular calcification and intradialytic hypotension in hemodialysis patients: clinical relevance and impact on morbidity and mortality

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Background: Vascular calcification (VC) and intradialytic hypotension (IDH) indicate morphological and functional disorders of the cardiovascular system in hemodialysis (HD) patients. However, their relationship and combined effects on clinical outcomes remain undetermined.

Methods: HD patients (n = 443) whose plain chest radiographs were examined for aortic arch VC were included. IDH was defined as nadir systolic blood pressure <90 mmHg or need for bolus fluid. We investigated the relationship between VC and IDH, and their clinical significance for cardiovascular events (CVEs) and death.

Results: VC was found in 57 HD patients (12.9%). IDH was more prevalent in patients with VC compared with those without VC (35.1% vs. 18.7%; $P = 0.004$). VC was independently associated with a 2.12-fold increase in the risk of IDH (95% confidence interval [CI], 1.03-4.36). In multivariate analysis, compared with patients with neither VC nor IDH, the coexistence of VC and IDH was independently associated with death (hazard ratio [HR], 3.83; 95% CI, 1.62-9.08) and CVE (HR, 3.77; 95% CI, 1.53-9.33), whereas VC or IDH alone was not. Patients with both VC and IDH had the highest risk for a composite event (HR, 3.56; 95% CI, 1.79-7.08). Significant synergistic interaction was observed between VC and IDH (P for interaction = 0.009).

Conclusion: VC was independently associated with IDH. Coexistence of VC and IDH was associated with higher risk of death and CVEs than either factor alone. There was a synergistic interaction between VC and IDH for the risk of a composite event.

Keywords: Cardiovascular event, Hemodialysis, intradialytic hypotension, vascular calcification