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Impact of intradialytic blood pressure changes on cardiovascular outcomes is independent of the volume status of maintenance hemodialysis patients

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Objectives: Intradialytic systolic blood pressure (SBP) changes are related to the volume status; however, whether SBP change impacts on adverse outcomes depend on the volume status remains uncertain. Therefore, we retrospectively investigated the relationship among intradialytic changes in SBP, cardiovascular outcomes, and volume status in maintenance hemodialysis patients.

Methods: We determined SBP changes (ΔSBP) as post-dialysis SBP minus pre-dialysis SBP and volume status as the ratio of extracellular water to total body water (ECW/TBW) using BIA.

Results: Of a total of 136 patients, there were 82 (60.3%) with ΔSBP −20 to 10 mmHg, 21 (15.4%) with ΔSBP ≤−20 mmHg, and 33 (24.3%) with ΔSBP ≥10 mmHg, and they were followed up for a median of 34 (19–64) months. The patients with ΔSBP ≥10 mmHg had higher pre- and post-dialysis ECW/TBW than did the others (P=0.007 and 0.001). Cardiovascular events more frequently occurred in the patients with ΔSBP ≤−20 mmHg and ≥10 mmHg than in those with ΔSBP −20 to 10 mmHg (Hazard ratio: 2.3 and 3.0; P=0.062 and 0.006); these associations persisted even after adjusting for post-dialysis ECW/TBW (P=0.056 and 0.028). Moreover, ΔSBP ≥10 mmHg was associated with increased cardiovascular mortalities independent of post-dialysis ECW/TBW (P=0.043). No association between ΔSBP ≤−20 mmHg and cardiovascular mortality was found.

Conclusions: There was an independent association of volume status between considerable SBP decrease or increase during hemodialysis and adverse cardiovascular outcomes. Other factors related to BP changes during hemodialysis must be investigated to manage these complications, in addition to appropriate volume control.