Abstract: P2640

The effect of dry-weight reduction guided by lung ultrasound on ambulatory aortic blood pressure and arterial stiffness parameters in hemodialysis patients

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Introduction and purpose: Arterial stiffness and aortic blood pressure (BP) augmentation are significantly increased in hemodialysis patients. Recent studies suggest that the prognostic significance of ambulatory recordings of arterial stiffness is high in hemodialysis. This study examines for the first time the effect of dry weight reduction with a standardized lung-ultrasound-guided strategy on ambulatory aortic BP and arterial stiffness parameters in hypertensive hemodialysis patients.

Methods: A total 71 hemodialysis patients with hypertension (mean home BP ≥135/85 mmHg), that were clinically euvoletic, were included in this single-blind randomized clinical trial. Patients were randomized in a 1:1 ratio in the active group (n=35), following a strategy for dry-weight reduction guided by the total number of US-B lines (US-B lines score) prior to a mid-week dialysis session and the control group (n=), following standard-of-care treatment. All patients underwent 48-hour ABPM with the Mobil-O-Graph monitor (SEM, Stolberg, Germany) and PWV measurement in office with SphygmoCor (ArtCor, Sydney, Australia) at baseline and after 8-weeks.

Results: Overall, the US-B lines change during follow-up were −5.3±12.5 in active versus +2.2±7.6 in control group (p<0.001), which corresponded to dry-weight changes of −0.71±1.39 versus +0.51±0.98 kg (p<0.001). The change in 48-hour cSBP was significantly greater in the active group (−6.30±8.90 vs −0.50±12.46, p=0.027); the relevant cDBP fall was marginally greater (−3.85±6.61 vs −0.63±8.36, p=0.077) in the active group. 48-hour cPP (41.51±9.63 vs 39.06±9.61 mmHg, p=0.004) and 48-hour PWV (9.30±2.00 vs 9.08±2.04 m/sec, p=0.032) were significantly reduced from baseline to study-end in the active group but remained unchanged in controls. In contrast, 48-hour AIx and AIx(75) did not change between baseline and study-end in both groups; changes in AIx(75) were similar in the two groups (−0.97±3.51 vs −0.36±4.25, p=0.517). PWV measured in office was decreased from baseline to study-end in the active (10.07±2.66 vs 9.79±2.81, p=0.038) but not in the control group.

Conclusions: A lung-ultrasound-guided strategy for dry-weight reduction reduces ambulatory aortic BP and arterial or office PWV, but not ambulatory AIx(75). These results suggest that dry-weight reduction can primarily reduce aortic BP levels and large arteries stiffness but not wave reflections from the periphery.