



P40 Arteriovenous Fistula, Blood Pressure and Arterial Reservoir-wave Analysis: Lessons From End-stage Renal Disease

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ABSTRACT

Purpose/Background/Objectives: According to reservoir-wave theory, excess pressure (XSP) is analogous to flow and related to excess cardiac workload. In end-stage renal disease (ESRD) patients, we have shown that XSPI is associated with increased mortality and is higher in patients with arteriovenous fistula (AVF). Recently AVF has been proposed treatment for treatment of resistant hypertension. However, this benefit may be mitigated through an increase in cardiac output. Therefore, we examine whether XSPI increases after creation of an AVF in ESRD patients.

Methods: Hemodynamic assessments were performed within 1 month before and 6 months after creation of AVF in ESRD patients. Carotid pressure waves were recorded using arterial tonometry, calibrated using brachial diastolic and mean arterial pressure. Using pressure only approach, reservoir-wave analysis was used to derive reservoir pressure (RP), XSP and their integrals (RPI, XSPI).

Results: 38 patients (63% male, mean age 59 ± 15 years) were assessed 3.9 ± 1.2 months Post-AVF. Carotid RP decreased slightly (115 ± 18 vs 109 ± 24 , $p = 0.060$), due to the reduction of diastolic BP (79 ± 10 vs 73 ± 12 mm Hg, $p = 0.003$). While, carotid systolic BP (123 ± 20 vs 119 ± 27 mm Hg, $p = 0.380$) remained unchanged, XSP and XSPI increased (XSP: 14 [12–19] to 17 [12–22] mmHg, $p = 0.031$; XSPI: 275 [212–335] to 334 [241–349] kPa.s, $p = 0.015$).

Conclusion: While AVF creation reduced diastolic BP, it resulted in higher XSPI, which has been associated with increased mortality. Therefore, the long-term efficacy of AVF in reducing clinical outcomes should be specifically addressed.

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