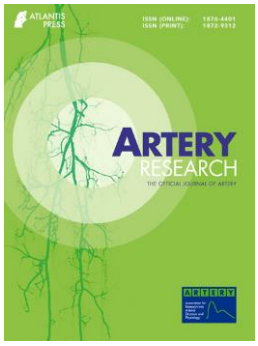

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4.8: ARTERIAL STIFFNESS AND ITS RELATIONSHIP TO MORTALITY IN PATIENTS WITH PERIPHERAL ARTERY DISEASE

Gabriel Dimitrov, Giovanni Scandale, Martino Recchia, Edoardo Perilli, Marzio Minola, Gianni Carzaniga, Maria Carotta, Mariella Catalano

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Conclusions: An independent association between hippocampal and parahippocampal CBF and systemic endothelial function is present in individuals with MCI.

4.7
PARAMETERS OF THE RESERVOIR-WAVE APPROACH AND MORTALITY IN DIALYSIS POPULATION

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Background: A new model has been proposed to explain hemodynamic consequences of arterial stiffness, which integrates both wave propagation and aortic reservoir function. The aim of this study was to assess the association between parameters of reservoir-wave analysis and all-cause mortality in a population with accelerated vascular ageing.
Methods: Among 311 patients with chronic kidney disease on dialysis, central arterial pressures were derived from applanation tonometry (Sphygmocor) of radial artery. Reservoir wave analysis was applied on radial pressure waveforms (without generalized transfer function) to obtain reservoir pressure (Peak RP), its integral (RP integral), excess pressure parameters (Peak XS, XS integral), and systolic (SC) and diastolic time constant (DC).
Results: During a median follow-up of 33 months, 204 (66%) deaths occurred. In Kaplan—Meier survival curves, only increasing tertiles of DC was associated with a significant decrease in survival time ($p < 0.001$). Amongst all parameters, only DC and XS integral were predictors of all-cause mortality in univariate Cox analysis as shown by hazard ratios for changes in 1-standardized deviation (HR 1-SD, Table 1). However, DC and XS integral were no longer significant when age was introduced in the model (p-value > 0.179).

Continuous variables	HR 1-SD	95% CI	p-value
Peak RP(mmHg)	1.121	0.987—1.273	0.079
RP integral(mmHg·sec)	1.050	0.920—1.197	0.470
Peak XS(mmHg)	1.112	0.966—1.281	0.138
XS integral(mmHg·sec)	1.217	1.062—1.395	0.005
SC($\times 10^{-2}$)	1.099	0.970—1.244	0.138
DC($\times 10^{-2}$)	1.186	1.60—1.328	0.003

Conclusions: Amongst all parameters of the reservoir-wave analysis, DC was the most important parameter associated with survival time and mortality. Despite its hypothetically more integrated approach to arterial tree function, none of the derived parameters showed a robust and independent association with mortality in this population. The study shows that despite its simplicity, arterial stiffness gradient remains the best predictor of mortality in this population.

4.8
ARTERIAL STIFFNESS AND ITS RELATIONSHIP TO MORTALITY IN PATIENTS WITH PERIPHERAL ARTERY DISEASE

Gabriel Dimitrov [1], Giovanni Scandale [1], Martino Recchia [2], Edoardo Perilli [1], Marzio Minola [1], Gianni Carzaniga [2], Maria Carotta [1], Mariella Catalano [2]
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Background and aim: Several studies (1,2) suggest that patients with peripheral artery disease (PAD) show an increase in arterial stiffness, nevertheless the impact on mortality is less documented. (3)
Methods: 228 PAD patients mean age (68 ± 9 years) were followed-up for $4{,}8 \pm 2$ years. Anthropometric and clinical measurements were collected, ankle-brachial index (ABI) was estimated with standard protocol and hemodynamic parameters (central blood pressure, aortic pulse wave velocity [aPWV], augmentation index [Aix]) were measured using applanation tonometry. Prognostic factors of mortality were identified by Cox proportional hazards regression model.
Results: During follow-up 26 (11,6%) deaths occurred. Among them, 5 (19%) were of cardiovascular origin. The Cox analysis applied to data relative to the third tertile of aPWV (11.4—21.4, m/s), is significant for age, ($p = 0.039$), smoking history ($p = 0.0003$) non use of lipid lowering drugs ($p = 0.026$) and lower height ($p = 0.007$) but not for aPWV ($p = 0.312$), Aix ($p = 0.075$) and ABI ($p = 0.305$).
Conclusions: The present study provides further insights into the lack of association between large artery stiffness, pressure wave reflections and mortality in PAD patients.
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Oral session V — Pathophysiology and intervention

5.1
EFFECTS OF THE SGLT-2 INHIBITOR EMPAGLIFLOZIN ON VASCULAR FUNCTION AND CENTRAL HEMODYNAMICS IN PATIENTS WITH TYPE 2 DIABETES

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Background: The selective sodium-glucose cotransporter 2 (SGLT-2) inhibitor empagliflozin leads to improved cardiovascular, renal and heart failure outcome in secondary prevention. To better understand these effects, we examined vascular function and central hemodynamics.
Methods: In this prospective, double-blind, randomized, placebo-controlled, crossover study 76 patients with untreated type 2 diabetes were randomized to empagliflozin 25 mg orally once daily or placebo. After 6 weeks of treatment with either empagliflozin or placebo and 1 week washout-phase, patients crossed over to the other treatment. Central hemodynamics and vascular function were assessed by central systolic blood pressure (BP), central pulse pressure, forward and backward wave amplitude under office (Sphygmocor, AtCor, Australia) as well as ambulatory conditions (Mobilograph, IEM, Aachen).
Results: Treatment with empagliflozin reduced central systolic BP (114 ± 12 vs. 119 ± 14 mmHg, $p < 0.001$), central diastolic BP (74.4 ± 6.9 vs. 76.8 ± 8.2 mmHg, $p = 0.004$) and central pulse pressure (39.5 ± 9.9 vs. 42.2 ± 11 mmHg, $p = 0.012$) compared to placebo. Forward ($p = 0.006$) and backward ($p = 0.026$) reflection amplitude, assessed under office conditions, were also significantly lower with empagliflozin than with placebo. Under ambulatory conditions over 24-hours we also observed lower central systolic (117 ± 9 vs. 119 ± 9 mmHg, $p = 0.059$) and diastolic (79 ± 7 vs. 81 ± 7 mmHg, $p = 0.011$) BP after 6 weeks treatment with empagliflozin compared to placebo. Pulse wave velocity under ambulatory conditions was also reduced after 6 weeks with empagliflozin ($p = 0.016$).
Conclusions: Our study demonstrated consistent significant improvements of vascular function and central hemodynamics with empagliflozin under office and ambulatory conditions. Our data support the concept that empagliflozin exerts beneficial effects on cardiovascular and heart failure outcome via improved vascular function.