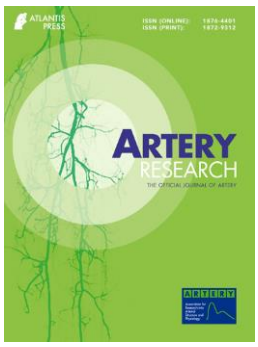

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P.055: EXPERIMENTAL STUDY OF THE EFFECTS OF A NEW NON-CYLINDRIC "CURVED-EDGED" STENT ON FLOW CHARACTERISTICS IN A MODEL OF A MILD ARTERIAL STENOSIS

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in the levels of cholesterol, triglycerides, glucose. Betaxolol has been well tolerated in most patients.
Conclusion: These results demonstrate that betaxolol increases arterial distensibility. This effect of betaxolol should be attributed to BP lowering and endothelial function improvement.

P.053
PROGNOSTIC SIGNIFICANCE OF FLOW MEDIATED DILATATION OF THE BRACHIAL ARTERY IN HYPERTENSIVE PATIENTS.

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Background: In uncomplicated hypertensive patients the prognostic role of endothelial dysfunction, as evaluated by flow-mediated vasodilatation of the brachial artery, has not been investigated.
Methods: A total of 175 prospectively identified uncomplicated hypertensives (age 53±5 years, 42% women, 48 with diabetes mellitus type 2) were studied. At baseline all subjects were untreated and underwent a baseline standard laboratory examinations. A standard echocardiogram was performed for the evaluation of LV anatomy and function and patients with systolic dysfunction or LV wall motion abnormalities were excluded. Endothelial function was measured as flow-mediated dilation of the brachial artery using high-resolution ultrasound.
Results: Patients were followed for 86±34 months (range 11–123 months). A first non fatal or fatal cardiovascular event occurred in 28 patients. The incidence of cardiovascular events was 1.4 and 3.1 per 100 patient-years in patients with a FMD above (n = 87) and below (n = 88) the median value, respectively ($p < 0.005$ by the log-rank test). In Cox analysis, controlling for age, gender, diabetes, hypercholesterolemia, smoking, and systolic BP at baseline, a low FMD conferred an increased risk of cardiovascular events (odds ratio 2.27, 95% confidence interval [CI] 1.01–5.15, $p < 0.001$).
Conclusions: The presence of endothelial dysfunction, as evaluated by flow-mediated vasodilatation of the brachial artery, identifies hypertensive patients at increased risk of non fatal and fatal cardiovascular events.

P.054
LOCAL ARTERIAL WAVE SPEED AT CAROTID ARTERY LEVEL IS REPRESENTATIVE OF CAROTIDO-FEMORAL PULSE WAVE VELOCITY AND AORTIC STIFFNESS: EVIDENCE BY A NEW ECHO-TRACKING APPROACH

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Carotido-femoral (CF) pulse wave velocity (PWV) is a marker of aortic stiffness. Recently a new ultrasound technique capable to provide real-time arterial waveform analysis ("E-track", Aloka) has been developed. When calibrated for blood pressure (BP), arterial stiffness parameters and a single point local wave speed (WS) are obtained.
Aim of this study was to evaluate whether or not common carotid (CCA) local WS may be representative of CF-PWV.
Thirty-one patients free of cardiovascular disease, with or without atherosclerotic risk factors (16 males; mean age 55±12, age range 24–72; mean BP 137±17/81±21 mmHg), underwent right CCA scanning by high resolution linear US probe (7.5 to 10 MHz, Aloka SSD-5500) for E-track evaluation. Single-point WS at CCA level was computed as $WS = (\Delta P/2Beta)$. CF-PWV and carotido-radial PWV (CR-PWV) were assessed by Complior (Artech, Paris). For both methods, at least 5 consecutive beats were averaged.
Mean WS, CF-PWV and CR-PWV were 9±4 m/s, 10.1±2 m/s, 10.9±1 m/s (p = n.s.). WS was directly related to CF-PWV ($r = 0.60$, $p < 0.001$) but not to CR-PWV ($r = 0.22$, p = n.s.). At Bland-Altman analysis, mean difference between WS and CF-PWV was –1.15±3.58, with all measurements but one within ±2sd. Both "Beta" and "Epsilon" derived by E-track also correlated directly with CF-PWV ($r = 0.50$ and 0.55, respectively, $p < 0.005$) but not with CR-PWV. Finally, the known correlations with age and pulse pressure were confirmed for both CF-PWV and WS (r between 0.40 and 0.65).
CCA stiffness and local WS appear representative of aortic stiffness as estimated by CF-PWV.

P.055
EXPERIMENTAL STUDY OF THE EFFECTS OF A NEW NON-CYLINDRIC "CURVED-EDGED" STENT ON FLOW CHARACTERISTICS IN A MODEL OF A MILD ARTERIAL STENOSIS

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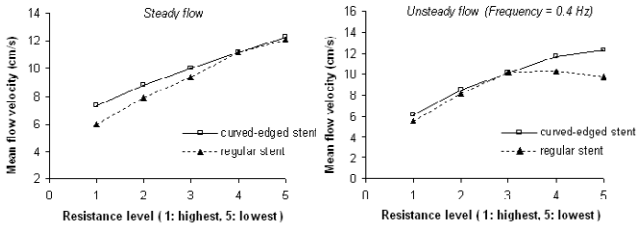
Background and Methods: Restenosis remains a major concern in vascular stenting, especially for ostial lesions. The purpose of this study was to investigate whether a non-cylindric stent, (with curved edges), implanted upstream of a mild arterial stenosis could be beneficial by increasing blood flow velocity and by limiting the flow recirculation zone in the vicinity of the stenosis. Steady and pulsatile flow fields were investigated in an axisymmetric model of an ostially stented arterial segment followed by a 50% stenosis, in an in-vitro model employing flow visualization technique. The stenosis was located close to the tube entrance a certain distance apart. Two different tube-entrance geometries, modelling a stented arterial segment, were studied regarding their effect on flow patterns at various Reynolds numbers (Re = 300–800).
Results: A decrease 3–6% in flow recirculation region at the vicinity distally to a 50% stenosis was observed when the "curved-edged" stent was used in the models compared to the regular cylindric stent. Mean flow velocity was increased for both steady flow (especially at low resistance) and pulsatile flow (for higher resistance), when the curved-edged configuration was used instead of the regular stent (figure).



Conclusions: These effects induced by the new stent configuration could be important and may potentially contribute to the delay of restenosis processes, which remains to be clarified in-vivo.

P.056
CAFFEINE CONSUMPTION ACUTELY INDUCES "CHAOS" IN BLOOD PRESSURE VARIABILITY, AS ASSESSED BY APPLANATION TONOMETRY OF THE RADIAL ARTERY AND DETRENDED FLUCTUATION ANALYSIS.

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The occurrence of continuous blood pressure (BP) fluctuations is an intrinsic feature of the cardiovascular system and is related to complex cardiovascular mechanisms and environmental stimulations or daily habits (i.e. coffee drinking). The aim of this study was to investigate the effect of caffeine on indices expressing the "chaotic", nonlinear characteristics of BP variability.
Methods: Fourteen healthy subjects consumed 240 mg of caffeine or placebo according to a randomized, double-blind, crossover design. Radial pressure waveforms were recorded by applanation tonometry of the radial artery at baseline and 30, 60, 90 and 120 min after ingestion of caffeine or placebo. Detrended fluctuation analysis was used to quantify the fractal correlation properties of the BP data by estimating the scaling (self-similarity) exponent α. Approximate entropy (ApEn) was also determined to assess BP irregularity. Analysis of variance for repeated measurements was used to assess changes in the measured variables over time.
Results: BP fluctuations demonstrated high regularity and predictability as indicated by the low values of ApEn (~0.2±0.3), and they remained unchanged after caffeine ingestion. In contrast, the long-term scaling exponent α of the BP time series was significantly increased from 0.99 to 1.04 ($p = 0.01$) after caffeine ingestion, while the placebo induced no significant change (figure).
Conclusions: Caffeine induced greater "randomness" in BP fluctuations. This caffeine effect might be considered to be beneficial but it should be further investigated.