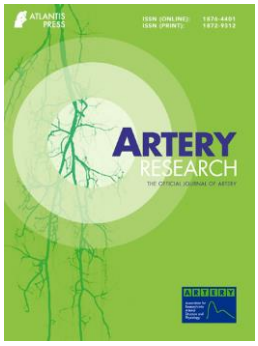

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P.079: EFFECTS OF LOW-GRADE INFLAMMATION ON ARTERIAL STIFFNESS AND WAVE REFLECTIONS IN HYPERTENSIVE PATIENTS WITH METABOLIC SYNDROME

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Ultrasound scans of the distal common carotid artery (right/left) were obtained from 120 patients with cardiovascular risk factors and 30 healthy controls. The C-IMT was measured on the far wall, 1 cm above the bifurcation. The dataset was analysed by two operators both automatically and manually. The first operator repeated the analysis twice.

The agreement between automatic and manual measurements was evaluated by Bland-Altman plots: a bias of -0.020mm and an interval of agreement of 0.027mm were obtained. Intra-observer variability was computed on the repeated measurements of the first operator. Bias was not significantly different from zero for both manual and automatic measurements, whereas the interval of agreement was 0.077mm in manual analysis and 0.012mm in automatic analysis. Coefficients of variation of 2.8% and 0.4% were obtained, respectively. Inter-observer variability showed a little bias (-0.032mm) only for manual analysis, whereas the interval of agreement was 0.075mm in manual analysis and 0.021mm in automatic analysis with coefficients of variation of 4.5% and 0.6%, respectively.

In conclusion, the new real-time automatic system represents a more feasible and reproducible method than the manual approach when used to estimate C-IMT in clinical studies and practice.

P.079
EFFECTS OF LOW-GRADE INFLAMMATION ON ARTERIAL STIFFNESS AND WAVE REFLECTIONS IN HYPERTENSIVE PATIENTS WITH METABOLIC SYNDROME

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Purpose: Metabolic syndrome is related to increased inflammatory status. Arterial stiffness is an important determinant of cardiovascular performance and a predictor of the corresponding risk. The aim of the present study was to investigate the association of low-grade inflammation with arterial stiffness and wave reflections in hypertensive patients with metabolic syndrome.
Methods: We studied 106 consecutive patients with never treated essential hypertension and metabolic syndrome, defined according to the Adult Treatment Panel III criteria. Arterial stiffness was assessed by measuring carotid-femoral (PWVc-f) and carotid-radial pulse wave velocity (PWVc-r). Heart rate corrected augmentation index (AIx_{75}) was studied as a measure of wave reflections and arterial stiffness. High-sensitivity C-reactive protein (hsCRP), serum amyloid A (SAA) and fibrinogen were measured as inflammatory indices using immunonephelometry.
Results: In univariate analysis, PWVc-f was correlated with both loghsCRP ($r=0.28$, $p=0.003$) and fibrinogen ($r=0.29$, $p=0.003$) whereas PWVc-r was associated with loghsCRP ($r=0.21$, $p=0.03$) and logSAA ($r=0.22$, $p=0.05$). No correlation was found between AIx_{75} and any of the measured biomarkers. After adjustment for several confounders, an independent association was observed between PWVc-f and loghsCRP ($\beta=0.24$, $p=0.01$) and fibrinogen ($\beta=0.16$, $p=0.04$) whereas an independent correlation was also emerged between PWVc-r and loghsCRP ($\beta=0.22$, $p=0.02$).
Conclusion: In hypertensive patients with metabolic syndrome both hsCRP and fibrinogen are related to arterial stiffness but not to wave reflections. This finding elucidates the potential role of inflammation in arterial stiffening in patients with hypertension and metabolic syndrome and may have important clinical implications.

P.080
AGE-RELATED CAROTID REMODELING AND WALL SHEAR RATE: INSIGHTS FROM A NOVEL MULTIGATE DOPPLER SYSTEM FOR INTEGRATED EVALUATION OF FLOW VELOCITY PROFILE AND DIAMETERS

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Background: Wall Shear Rate (WSR) is a main determinant of shear stress (WSS), the viscous drag exerted on the arterial wall by the flowing blood. In human studies WSR is only roughly estimated by a static measurement of diameter and centerline systolic flow velocity. A double beam multigate Doppler (MGD) system, capable to provide simultaneous monitoring of arterial diameter and WSR, was recently developed and validated by our group.
Aim: To investigate in man the relations between WSR, age, arterial geometry and distension in common carotid artery (CCA) by MGD.
Methods: Twentyfive normotensive subjects, age 30-53, underwent CCA scan by an ultrasound system (Esaote Megas, 7.5-10.0 MHz probe) interfaced with MGD. Ultrasound beams were setted transversely for diameter assessment, and at an interbeam angle of 35° for flow velocity profile and WSR determination. Autocorrelation algorithm and spectral analysis of backscattered signals from walls an erithrocytes were used for estimating distension and WSR, respectively. IMT was also measured.
Results: Mean CCA diameter and distension were 6.9 ± 0.6 mm and 499 ± 188 μm; WSR (average through cardiac cycle) was 335 ± 87 s^{-1} and 283 ± 80 s^{-1} at near and far wall. WSR was inversely related (r from -0.47 and −0.52) to age, diastolic BP, CCA diameter and IMT, and directly to distension ($r = 0.41$). Significant relations with age were confirmed for BP, carotid diameter and IMT.
Conclusion: Our findings are in keeping with the hypothesis that an age-related reduction of WSR, possibly associated to vessel dilation, may represent a mechanism underlying the age-related IMT increase.

P.081
VALIDITY OF THE ONE-THIRD RULE TO CALCULATE MEAN ARTERIAL PRESSURE

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Objective: Empirical formulas are frequently used to estimate mean arterial pressure (MAP) from systolic (SBP) and diastolic (DBP) blood pressure. We investigated the validity of the $1/3^{rd}$-$2/3^{rd}$ rule (one-third of the pulse pressure (PP) to the DBP) for the radial, brachial and carotid artery using tonometry.
Methods and results: Radial, brachial and carotid tonometer measurements were performed in 1927 subjects (1423 normotensives and 504 hypertensives, age 35-55, 1008 men and 919 women). First, brachial tonometry curves were calibrated using sphygmomanometer systolic and diastolic blood pressure, and MAP_{bra} was assessed as the numerical average of this curve. Second, radial and carotid waveforms were calibrated using DBP_{bra} and MAP_{bra}, assuming these values are constant through the arterial tree. We calculated the percentage (form factor) of the PP to be added to the DBP to assess MAP at the radial (FF_{rad}), brachial (FF_{bra}) and carotid artery (FF_{car})(Table 1).

Table 1

	Men	Women	Total
MAP, mmHg (SD)	101.1 (11.7)	98.6 (12.3)	99.9 (12.1)
FF_{rad}, % (SD)	36.8 (3.1)	39.5 (2.9)	38.1 (3.3)
FF_{bra}, % (SD)	41.3 (3.0)	43.7 (3.1)	42.4 (3.3)
FF_{car}, % (SD)	43.8 (3.2)	44.1 (3.4)	43.9 (3.3)

Conclusions: (1) Using the one-third rule underestimates the MAP. (2) FF^{bra}, 42.4% is in agreement with the earlier reported form factor of 40%, validated with intrabrachial pressure (W. Bos et al.). (3) The form factor seems to depend strongly on the artery measured. It decreases from the aorta to the peripheral arteries and differs between men and women, with a higher associated factor for women.

P.082
BENEFICIAL EFFECT OF LAUGHTER ON ARTERIAL STIFFNESS AND WAVE REFLECTIONS: THE ROLE OF INFLAMMATION, ENDOTHELIAL FUNCTION AND OXIDATIVE STATUS

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Background: Unfavourable psychogenic factors increase the risk of cardiovascular outcomes. Aim of this study was to evaluate the impact of a positive psychological intervention (laughter) on aortic stiffness and wave reflections, known determinants of cardiovascular performance and predictors of