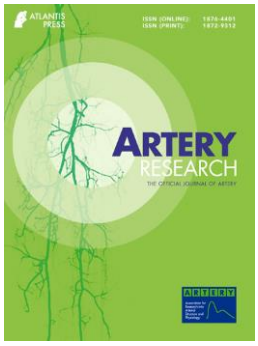

ATLANTIS PRESS

Artery Research

ISSN (Online): 1876-4401 **ISSN (Print): 1872-9312**
Journal Home Page: https://www.atlantis-press.com/journals/artres

P1.49: EVALUATION OF ARTERIAL STIFFNESS AND CARDIOVASCULAR RISK STRATIFICATION IN A GENERAL POPULATION IN NORTHERN ITALY. THE VOBARNO STUDY

M. Salvetti, M.L. Muiesan, A. Paini, C. Monteduro, E. Belotti, C. Corbellini, G. Galbassini, C. Agabiti Rosei, L. Micheletti, C. Aggiusti, F. Marino, F. Bertacchini, Agabiti Rosei E

To cite this article: M. Salvetti, M.L. Muiesan, A. Paini, C. Monteduro, E. Belotti, C. Corbellini, G. Galbassini, C. Agabiti Rosei, L. Micheletti, C. Aggiusti, F. Marino, F. Bertacchini, Agabiti Rosei E (2008) P1.49: EVALUATION OF ARTERIAL STIFFNESS AND CARDIOVASCULAR RISK STRATIFICATION IN A GENERAL POPULATION IN NORTHERN ITALY. THE VOBARNO STUDY, Artery Research 2:3, 103–104, DOI: https://doi.org/10.1016/j.artres.2008.08.356

To link to this article: https://doi.org/10.1016/j.artres.2008.08.356

Published online: 21 December 2019

Conclusions: 1- Subclinical vascular disease is more frequent and severe in HT patients.2- Indicators of subclinical vascular disease in this subset of p. allow a more precise diagnosis of subclinical vascular. (ESC/ESH guidelines 2007)3-Vascular score of severity is higher in HT p. than in NT.

doi:10.1016/j.artres.2008.08.351

P1.45

GAMMA-GLUTAMYLTRANSFERASE - ANOTHER MARKER OF THE CARDIOVASCULAR RISK AND EARLY ARTERIAL DAMAGE?

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Purpose: The aim of the study was to evaluate whether gamma-glutamyl-transferase (γ-GT) is the marker of the cardiovascular (CV) risk assessed by the SCORE system and early arterial damage.
Methods. Serum levels of γ-GT, lipid profile, inflammatory markers and plasma glucose of 209 subjects (40-65 years old, 97 males) without clinically overt cardiovascular disease were checked. CV risk was evaluated by SCORE system. Parameters of arterial stiffness — aortic augmentation index (AIx/HR) and carotid-radial pulse wave velocity (PWV) - were obtained by applanation tonometry. Endothelium-dependent flow-mediated dilatation (FMD) in the brachial artery and carotid IMT were assessed using high resolution B-mode ultrasonography.
Results: We found that SCORE system is associated with the γ-GT. SCORE risk significantly increased with each quartile of γ-GT (ANOVA, $p=0.003$). γ-GT was significantly higher in high (≥5%) vs. low (<5%) CV risk groups (43.82 ± 48.31 vs. 24.55 ± 22.66, $p<0.0001$). In the univariate analysis γ-GT was significantly associated with the FMD in the brachial artery ($p=0.025$), carotid-radial PWV ($p=0.042$) and the presence of the carotid plaques (CP) ($p=0.002$). The multiple regression analysis revealed that only gender (beta = -0.28, $p<0.001$), age (beta = 0.301, $p<0.001$) and triglycerides (beta = -0,147, $p=0.046$) were associated with FMD. PWV was independently associated with gender (beta = -0.319, $p<0.001$), glucose (beta = 0.248, $p=0.001$) and age (beta = 0.218, $p=0.003$).
Conclusions: The study suggests that serum γ-GT is a surrogate marker of CV risk. Elevation of γ-GT is associated with the increased endothelial dysfunction, arterial stiffness and carotid plaques, but not in the independent manner.

doi:10.1016/j.artres.2008.08.352

P1.46

INTIMA-MEDIA THICKNESS VARIATION AS PREDICTOR OF ATHEROSCLEROSIS

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Background: The aim of the present study was to ascertain in vascular diseased patients the morphological characteristics of the common carotid artery (CCA), i.e. intima-media thickness (IMT) and IMT ipsi- and bilateral intrasubject variation (DIMT) and to relate them to the carotid bulb stenosis degree score to establish the relevance of each parameter.
Methods: In 154 patients, referred to the vascular laboratory for CCA examination (mean 66 years, 48% male), the carotid bulb was visualized in Doppler-mode to rate the stenosis degree based on blood flow velocities. CCA IMT and ΔIMT were measured using multiple M-mode images (covering 3 heart beats). The association of morphological characteristics with stenosis degree was evaluated with Pearson correlation (r).
Results: Ipsi- and bilateral ΔIMT were stronger associated to stenosis degree score ($r=0.67$ and $r=0.60$, respectively, with $p<0.001$) than IMT ($r=0.40$, $p<0.001$). The averaged IMT increased slightly for stenosis degree<5 and abruptly for the two highest values ($r=0.93$, $p=0.001$). Mean ipsi- and bilateral ΔIMT presented a consistent graded increase with stenosis degree over the entire range (0-7), reaching a correlation close to 1 ($r=0.98$ and $r=0.97$, respectively, $p<0.001$).
Discussion: Although CCA is a region less prone to plaques, the morphological characteristics of CCA are positively correlated with stenosis degree score. The present study indicates that ipsi- and bilateral ΔIMT exhibit a stronger relation than IMT to the severity of carotid artery stenosis, underlining that ΔIMT carries different information than IMT. In conclusion, in the CCA, ΔIMT rather than IMT substantiates patient risk evaluation.

doi:10.1016/j.artres.2008.08.353

P1.47

CORRELATION BETWEEN INDICES OF ARTERIAL STIFFNESS AND ESTIMATES OF CARDIOVASCULAR EVENTS: PROMOTING CARDIOVASCULAR RISK STRATIFICATION IN CLINICAL PRACTICE

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Background: Aortic and carotid stiffness are independent predictors of all cause, cardiovascular, and cerebrovascular morbidity and mortality in several clinical conditions as well as in the general population.
Aim of the study: was to investigate the associations between non-invasively determined aortic and carotid artery stiffness with vestimates of absolute cardiovascular (CV) risk in healthy subjects and subjects with risk factors.
Materials: 139 subjects were recruited [104 with one or more CV risk factors (cases: 46 males, mean age 49 years), 35 healthy controls (16 males, mean age 43 years)]. Common carotid artery stiffness was investigated by an ultrasound system with wall track option (Aloka SSD-5500, Tokyo), providing a single point local wave speed (WS). Aortic stiffness was estimated by the carotid-femoral pulse wave velocity (CF-PWV) (Complior, Paris). Ten-year absolute CV risk was estimated using both the Framingham risk score (FRS) chart and the Edinburgh University Risk Chart (EURC, including echocardiographic left ventricular hypertrophy).
Results: Cases had significantly ($p<0.001$) higher CF-PWV (10.5 ± 2.2 vs 8.6 ± 1.3 m/s), WS (7.6 ± 1.4 vs 5.8 ± 0.8 m/s), FRS (10.8 ± 10.2 vs 3.1 ± 3.1%), and EURC score (21.5 ± 16 vs 6 ± 5%). Significant positive correlations ($p<0.001$) were observed for CF-PWV and WS with FRS ($r=0.56$ and 0.52, respectively) and EURC score ($r=0.64$ and 0.61, respectively). When subdividing CF-PWV and WS in tertiles a significant intertertile difference was observed only for progressively increasing values of EURC score.
Conclusions: indices of subclinical cardiovascular involvement obtained by an integrated ultrasonographic investigation may help to promote CV risk stratification in clinical practice.

doi:10.1016/j.artres.2008.08.354

P1.48

AORTIC DISSECTIONS: WHY A PATIENT HAS TO WAIT (MOSCOW-BASED RETROSPECTIVE STUDY)

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Aortic dissections (AD) are considered among most serious life-threatening conditions requiting emergency medical intervention. However, delays in recognition and treatment often occurred.
Our aim was to determine mean time intervals between 1) fist symptoms appearance (diagnostic delay, DD), 2) first contact with a doctor (Doctor-related delay, DRD) and final establishing of a confirmed diagnosis.
We analyzed 37 cases of patients admitted to general hospital with AD (84.6% males, mean age — 58.3 years).
Type A AD occured in 58.9% cases, type B - in 41.1%. The most frequent risk factors were atherosclerosis and hypertension, 94.8%. We identified 1 case of Marfan syndrome and 1 case lues tertiariai. Thoracic pain was observed in all cases: 38% patients complained of back pain and 84,6 % of anterior chest pain. Abnormal pulsation and murmurs were found in 33.3% and 25.6% of patients respectively. The DD was 1-23 days (mean 12.4), DRD was 1- 16 days (mean 9.5).DD and DRD were significantly increased in patients of 70 years of age and older and in patients with combined pathology, including coronary heart disease ($p<0.043$, $p<0.14$ respectively).
Majority of the DD and DRD delays were due to either masked symptoms or blurred clinical picture, or inadequate use of existing diagnostic facilities. More attention should be paid to postgraduate continuous medical education both of GPs referring patients to a hospital and of hospital-based staff.

doi:10.1016/j.artres.2008.08.355

P1.49

EVALUATION OF ARTERIAL STIFFNESS AND CARDIOVASCULAR RISK STRATIFICATION IN A GENERAL POPULATION IN NORTHERN ITALY. THE VOBARNO STUDY

M. Salvetti, M.L. Muiesan, A. Paini, C. Monteduro, E. Belotti, C. Corbellini, G. Galbassini, C. Agabiti Rosei, L. Micheletti, C. Aggiusti, F. Marino, F. Bertacchini, Agabiti Rosei E.
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Hypertension guidelines underline the importance of quantification of total cardiovascular(CV)risk;an extensive evaluation of target organ damage

(TOD)may increase the number of patients classified at high CV risk.The aim of our study was to assess the effect of the evaluation of different forms of TOD,in addition to ''routine'' work-up,on CV risk(CVR)stratification in a general population.
Methods:In 385 untreated subjects(age 57±10 years,44% males,64% hypertensives(HT),32% treated)left ventricular and carotid artery structure and carotido-femoral PWV were measured. All subjects underwent laboratory examinations.Subjects were divided into risk categories according to ESH/ESC guidelines before and after TOD evaluation.
Results: After routine work up patients were classified as follows:7% at average CVR,35% at low CVR,26% at moderate CVR,31 at high CVR and 1% at very high CVR.The proportion of patients at low or moderate CVR reclassified at high CVR were 6%,12%,14% and 32% after echocardiography,albuminuria,PWV and carotid ultrasound(CUS) respectively(X2 $p<0.001$ for all vs routine). Assessment of PWV in addition to echocardiography lead to an increase of the proportion of patients at high CVR (from 6% to 17%,$p<0.001$),as for PWV in addition to albuminuria (from 12 to 22%,$p<0.01$)but did not affect risk stratification in addition to CUS(from 32% to 35%, p ns).
Conclusion: Measurement of PWV may significantly change CVR stratification in addition to echocardiography and to detection of albuminuria, but not after CUS;our results confirm that evaluation of different forms of TOD is useful for a more accurate assessment of global CVR.

doi:10.1016/j.artres.2008.08.356

P1.50
IS AORTIC PULSE WAVE VELOCITY A STRONGER MARKER OF CARDIOVASCULAR RISK THAN CALCULATED RISK SCORES IN YOUNGER WOMEN?

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Introduction: Younger women are considered to have low cardiovascular (CV) risk. Predictive scoring systems aim to assess overall CV risk from multiple risk factors to guide treatment decisions. Aortic pulse wave velocity (aPWV) may be a more efficient, 'integrated' CV index providing a more effective treatment target than risk factors alone. We examined the relationship of CV risk scores to aPWV in younger women.
Patients and Methods: 193 pre-menopausal women (age 36.2 years, 95% CI 35.1-37.2) underwent anthropometric, biochemical and aPWV measures. 10 year CV risk score was estimated using the Joint British Guidelines, similar to the Europe-wide 'Heartscore' initiative. BMI, waist & bio-impedance estimates of adiposity (fat mass index) were tested.
Results: CV risk scores were significantly higher in women who had had gestational diabetes (2.35%) than in those without (1.34%), $p=0.004$, but surprisingly were not for previous gestational hypertension (1.21 vs. 1.27 %). After adjusting for other CV risk modulators *not* included in risk scores, (social deprivation (Townsend's index), hsCRP, heart rate), residual independent influences on aPWV were:

	Beta	95% CI of beta	p
Fat mass index (kg/m2) (or BMI or Waist)	−0.09	-0.172 to -0.008	0.031
Calculated 10 year absolute CV risk	0.122	0.023 to 0.221	0.016

Conclusion: In young women, even without overt diabetes or hypertension, adjusting for other factors, current adiposity and calculated CV risk were independently related to aPVW. This suggests aPWV reflects the 'load' of CV risk at this age better than CV scores alone (which omit obesity indices).

doi:10.1016/j.artres.2008.08.357

P1.51
EFFECTS OF ELECTRICAL BARORECEPTOR STIMULATION ON CENTRAL ARTERIAL HEMODYNAMICS ASSESSED IN A LARGE ANIMAL MODEL

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Electrical stimulation of the carotid baroreceptor has been shown to be an effective therapy for patients with (resistant) hypertension. However, the exact mechanism leading to blood pressure reduction is not fully elucidated. We measured left ventricular pressure and volume, ascending and abdominal aortic pressure using high-fidelity transducers in 9 anaesthetized dogs (24.8 ± 2.9 kg) at baseline and during electrical stimulation of the carotid baroreceptors. Therapy significantly (all $P<0.001$) lowered mean (from 81.1±7.6 to 54.8±5.5 mmHg), systolic (from 95.7±7.8 to 78.6±6.0 mmHg) and diastolic (from 66.6±8.3 to 41.4±6.2 mmHg) pressures. Cardiac output remained unchanged, but stroke volume tended to increase while heart rate decreased (83.5±15.3 to 67.2±19.3 beats/min, $P=0.002$). Systemic vascular resistance decreased from 1.25±0.50 to 0.92±0.44 AU, $P=0.002$). There was no change in central-to abdominal pulse transit time, and we could not unequivocally demonstrate a change in total arterial compliance. Therapy had a drastic effect on the morphology of the pressure waveforms and on the relationship between abdominal and central aortic pressure. Pressure was amplified at baseline but damping of the pressure pulse along the aorta was observed during stimulation, suggesting a drastic impact of therapy on pressure wave reflection. This was confirmed by a decrease in the magnitude of wave reflection (from 0.54±0.13 to 0.39±0.08, $P=0.014$). We conclude that, in an acute animal model, carotid baroreceptor stimulation significantly lowers blood pressure through vasodilation, with important effects on patterns of wave reflection. Further research is mandatory in experimental (conscious) models of hypertension and in patients.

doi:10.1016/j.artres.2008.08.358

P1.52
REGULATION AND ACTIONS OF CARDIOTROPHIN-1 IN CULTURED RAT VASCULAR SMOOTH MUSCLE CELLS

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Cardiotrophin-1 (CT-1) is a cytokine belonging to the interleukin-6 superfamily that exhibits trophic and survival properties in a number of cell types. CT-1 expression has recently been identified within the media of atherosclerotic arteries, but its role in the vessel remains unknown. The aim of this study is to characterize CT-1 actions and regulation in vascular smooth muscle cells (VSMC). Primary rat aorta VSMC were stimulated with CT-1 (10^{-11}-10^{-9}M) for up to 48 hours, without and with antibodies against CT-1 receptors. Moreover, the effects of aldosterone (10^{-8}-10^{-6}M) and angiotensin II (10^{-9}-10^{-7}M) on CT-1 expression were evaluated. Cell proliferation was determined by MTT assay. The expression of CT-1, collagen type I, and fibronectin was quantified by Western blot. Matrix metalloproteinases (MMPs) activities were assessed by gelatin and casein zymographies. A 48-hour treatment with CT-1 induced VSMC proliferation in a dose-dependent manner ($p<0.01$). A 24-hour incubation with CT-1 led to an increased expression of collagen type I ($p<0.01$) and fibronectin ($p<0.05$), with a parallel and dose-dependent increase in active MMP-2 ($p<0.01$), MMP-3 ($p<0.05$) and MMP-9 ($p<0.01$), all of these effects being reversed in the presence of antibodies against CT-1 receptors. Whereas VSMC spontaneously expressed CT-1, both aldosterone and angiotensin II enhanced ($p<0.01$) CT-1 expression in these cells in a dose- and time-dependent manner. CT-1 induces proliferation and a secretory phenotype in VSMC. Upregulation of CT-1 expression by angiotensin II and aldosterone in VSMC suggests a mediator role for this cytokine in alterations of these cells caused by the RAAS in vascular diseases.

doi:10.1016/j.artres.2008.08.359

P1.53
INTRINSIC VERSUS EXTRINSIC OXIDATIVE STRESS AND THEIR IMPACT ON ARTERIAL ELASTIC PROPERTIES: THE ROLE OF NADPH OXIDASE AND SMOKING ON WAVE REFLECTIONS AND AORTIC PRESSURES

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Purpose: The NADPH oxidase system produces superoxide (intrinsic oxidative load) while smoking is a well-established extrinsic oxidative factor. Carriers of the G allele (AG or GG) at position -930 of the CYBA gene of NADPH oxidase produce increased amounts of superoxide. We investigated the effect of intrinsic (NADPH produced) versus extrinsic (smoking) oxidative stress on arterial elastic properties.