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### **P1.19: ASSOCIATION OF AORTIC STIFFNESS AND LIPOPROTEIN APO-A1 WITH PERIPHERAL ARTERIAL DISEASE: RESULTS OF A NINE-YEAR FOLLOW-UP**

J. Seidlerova, J. Filipovsky

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and 29 T2DM (aged 60±9 years; 48.6% male) participants. Daytime rate of systolic BP variation (BPV) was derived from 24 hour ambulatory BP as the 3-hour moving average for the slope of the change in systolic BP between each systolic BP reading over time.

**Results:** There was a non-significant trend for patients with T2DM to have greater BPV compared with non-diabetics (35.9±7.1 versus 32.6±6.6;  $p=0.08$ ). BPV was significantly and negatively associated with retinal arteriolar diameter in non-diabetics alone ( $\beta=-0.006$ ,  $p=0.03$ ), but not in people with T2DM ( $\beta=0.004$ ,  $p=0.402$ ), even after adjusting for age, body mass index and ambulatory systolic BP (either night time, day time or 24 hour systolic BP).

**Conclusions:** BPV was inversely related to retinal arteriolar diameter only in people without T2DM. This suggests that mechanisms underlying retinal vascular disease may differ between people with and without T2DM, with the rate of BP variation possibly being an important factor.

#### P1.16 CORRELATION BETWEEN WALL-TO-LUMEN RATIO OF RETINAL ARTERIOLES AND CLINIC AND 24 HOURS BLOOD PRESSURE

C. Agabiti Rosei, M. L. Muiesan, A. Paini, M. Salvetti, C. Aggiusti, A. Cancarini, S. Duse, F. Semeraro, D. Rizzoni, E. Agabiti Rosei  
*University of Brescia, Brescia, Italy*

**Objective:** Wall-to-lumen ratio of retinal arterioles might serve as an in-vivo parameter of vascular damage. Previous studies have shown a correlation between retinal arteriolar structure and blood pressure values, measured both in the clinic and during 24 hours ambulatory monitoring. We analyzed the impact of brachial clinic blood pressure (BP), of central BP and of 24 hours BP values on wall-to-lumen ratio of retinal arterioles.

**Methods:** In 267 subjects (129 males, age range 20-72 years; mean 54±7 years) wall-to-lumen ratio of retinal arterioles was assessed in vivo using scanning laser doppler flowmetry (Heidelberg retina flowmeter, Heidelberg Engineering). In addition clinic and 24 hours BP values were measured. Central hemodynamics and augmentation index (Ai) were assessed by pulse wave analysis.

**Results:** In never treated patients with essential hypertension ( $n=56$ ) a higher wall-to-lumen ratio ( $0.37\pm 0.19$  vs.  $0.30\pm 0.13$ ,  $P=0.05$ ) was observed in comparison with normotensive individuals ( $n=115$ ); no significant differences were observed between treated ( $n=96$ ) and untreated hypertensive patients.

Wall to lumen ratio and wall cross sectional area of retinal arterioles were significantly related to clinic systolic BP ( $r=0.23$ ,  $P=0.005$ ) and PP ( $r=0.18$ ,  $P=0.005$ ), to 24 hours systolic BP ( $r=0.28$ ,  $P=0.0001$ ) and PP ( $r=0.19$ ,  $P=0.003$ ) and to central systolic BP ( $r=0.20$ ,  $P=0.01$ ) and central PP ( $r=0.21$ ,  $P=0.001$ ). Multiple regression analysis including all BP indices revealed that only mean systolic 24 hours BP is independently associated with an increased wall-to-lumen ratio of retinal arterioles.

**Conclusion:** in this quite large group of hypertensive patients and normotensive individuals 24 hours systolic BP seems to be the strongest determinant of increased WLR of retinal arterioles.

#### P1.17 AUTONOMIC NERVOUS ACTIVITY IN REACTIVE HYPEREMIA AND CONDUIT/RESISTANCE ARTERIAL ENDOTHELIAL FUNCTIONS IN PATIENTS WITH HYPERTENSION

H. Tomiyama, M. Odaira, A. Yamashina  
*Tokyo Medical University, Tokyo, Japan*

**Aims:** Flow-mediated vasodilatation of the brachial artery (FMD), a marker of conduit arterial endothelial function, and reactive hyperemia index (RHI), a marker of resistance arterial endothelial function, measured by peripheral arterial tonometry, are known to be weakly associated with each other, however, the mechanisms underlying this weak association remain to be fully clarified.

We examined whether the autonomic nervous activation induced by the 5 minutes' forearm clamping used to induce reactive hyperemia might exert any influence on the FMD and RHI in subjects with hypertension.

**Methods and results:** In 115 subjects with hypertension (age  $61 \pm 1$  y/o), the FMD and RHI were measured simultaneously, and the heart rate variability (HRV), as a measure of the autonomic nervous activity, was calculated from the electrocardiographic recordings obtained before (5 minutes' recording) and after the start of forearm clamping (10 minutes' recording). The HRV parameters {low-frequency component (LF), high frequency component (HF), and the ratio (LF/HF) between the two} calculated from

the records (15 minutes' recording in total) were found to show no significant relationship with either the FMD or RHI. Then, the change in HRV induced by forearm clamping was measured as the percent change after the start of clamping relative to that before the start of clamping. A multivariate linear regression analysis with adjustments for confounding variables demonstrated that the RHI, but not FMD, was significantly associated with the percent change of the LF/HF associated with forearm clamping ( $\beta = -0.222$ ,  $p = 0.017$ ).

**Conclusion:** Sympathetic nervous activation induced by 5-minutes forearm clamping to induce reactive hyperemia may affect the RHI, but not the FMD in subjects with hypertension. This difference may be one of the mechanisms underlying the existence of only a weak association between FMD and RHI.

#### P1.18 FEASIBILITY OF 24-HOUR PULSE WAVE VELOCITY ANALYSIS IN THE MANAGEMENT OF PATIENTS WITH RENAL TRANSPLANTATION

I. E. Minyukhina<sup>1</sup>, I. N. Posokhov<sup>2</sup>  
<sup>1</sup>*Volga District Medical Center, Nizhny Novgorod, Russian Federation*  
<sup>2</sup>*Hemodynamic Laboratory Ltd, Nizhny Novgorod, Russian Federation*

The aim of study was to assess the feasibility of 24-hour PWV analysis in management of patients with renal transplantation (RT). Overall, 41 patients were recruited from the transplant waiting list. All the measurements were performed before and at 1 and 20 weeks after RT. The Pulse Time Index of Norm (PTIN) defined as the percentage of 24-hour period during which the PWV does not exceed 10 m/second. Before RT, the mean PTIN was 56.3 (SD, 18.4). Then, a week after the RT, a decrease in PTIN was observed in most cases, going to 27.6 (SD, 11.1). After 20 weeks, the mean PTIN increased again to 52.0 (SD, 23.6). We found that the persistence of arterial stiffness disturbances after RT appears relatively predictable. We determined the cut-off value of PTIN that could predict the two states of PTIN: a state of improvement or a state of decline/without change. The cut-off value of PTIN at 45% had a sensitivity of 69%, specificity of 76%, and AUC of 0.65. The analysis of variance showed that in the group with initial PTIN of 45% or higher, the PTIN in the remote period after transplantation changed significantly ( $P<0.05$ ), whereas in the group with an initial PTIN lower than 45%, there were no significant changes. Thus, the analysis of 24-hour pulse wave velocity in the management of patients with RT using PTIN is feasible. PTIN seems to give us an opportunity to optimize aggressive therapeutic approach to postoperative hypertension in patients with RT.

#### P1.19 ASSOCIATION OF AORTIC STIFFNESS AND LIPOPROTEIN APO-A1 WITH PERIPHERAL ARTERIAL DISEASE: RESULTS OF A NINE-YEAR FOLLOW-UP

J. Seidlerova, J. Filipovsky  
*Faculty of Medicine, Charles University, Pilsen, Czech Republic*

**Background:** We investigate whether peripheral arterial disease (PAD) detected by ankle brachial index (ABI)  $<0.9$  is independently associated with aortic stiffness and lipoprotein (a) [Lp(a)] in elderly subjects free from PAD at baseline.

**Methods:** The present study included 96 lecture attendees ("Continuing Adult Education") who were examined at baseline and after a median follow-up of 9.5 years. We used multiple linear and logistic regression analyses to assess predictors of ABI change. As independent covariates we considered parameters with known effect on arterial stiffness or ABI and use of antihypertensive medication.

**Results:** At baseline, mean age was  $67.2\pm 4.9$  years, 79.2% were women, 33.3% of subjects had arterial hypertension and 5.2% diabetes mellitus, respectively. During the follow-up, the ABI decreased ( $1.15\pm 0.12$  vs.  $1.00\pm 0.19$ ;  $P<0.0001$ ) and there were 27 incident cases of PAD. While accounting for covariates, change in ABI was associated with Lp(a) ( $\beta = 0.045\pm 0.018$ ;  $P=0.017$ ) and PWV ( $\beta = -0.038\pm 0.017$ ;  $P=0.025$ ). Additional adjustment for antihypertensive treatment weakened the association between PWV and change in ABI ( $P=0.091$ ). The incidence of PAD was associated only with Lp(a) (OR 0.55, 95%CI 0.32 – 0.97;  $P=0.038$ ). PWV was not significant predictor of incident PAD neither in basic adjusted model nor in model adjusted also for antihypertensive treatment ( $P\geq 0.18$ ).

**Conclusions:** In elderly subjects without manifest PAD at baseline are lipoprotein (a) and aortic stiffness associated with change in ABI and incidence of peripheral arterial disease, however antihypertensive treatment started during follow-up modifies these observations.