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P.003: EFFECTS OF AGING ON PULSE WAVE VELOCITY IN AFRICAN MEN AND WOMEN

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Poster Presentations

P.001

ACUTE EFFECTS OF NICOTINE ON PERIPHERAL AND CORONARY VASCULAR FUNCTION IN YOUNG NON-SMOKERS

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Background: Despite overwhelming evidence associating cigarette smoking with arterial stiffening, the precise mechanisms involved in this relationship are not fully understood. The aim of this study was to test the hypothesis that nicotine could increase aortic wave reflection and that this would be accompanied by an alteration in skin blood flow reactivity and a reduction in myocardial perfusion.

Materials and methods: We conducted a prospective study, divided into two experimental settings, in 21 healthy, non-smoker, male subjects. In the first setting (n=11), subjects received a placebo and a 2 mg nicotine tab, according to a randomized, double-blind, cross-over design. Each subject underwent measurements at baseline and for 1 hour post-nicotine or placebo, using the augmentation index (AIx) of the aortic pressure waveform to assess wave reflection. Endothelial function was evaluated twice, at baseline and 40 minutes after nicotine or placebo intake, using two hyperemic tests: skin heating (SkBF-H) and acetylcholine iontophoresis (SkBF-Ach). In the second experimental setting (n=10), subjects underwent an N-13 positron emission tomography (PET) study before and 60 minutes after 2 mg of nicotine, in order to quantify myocardial perfusion.

Results: Nicotine administration was associated with an increase in heart rate (HR) ($P < 0.001$) and AIx corrected for HR ($p = 0.013$) throughout the study. No microcirculatory effects of nicotine were observed on endothelial function as assessed by SkBF-h or SkBF-Ach. The subendocardial viability ratio was decreased ($p = 0.006$), suggesting an impairment in myocardial perfusion induced by nicotine. This was confirmed by the N-13 PET studies, which revealed a reduction in resting myocardial perfusion (from 0.96 ± 0.07 to 0.84 ± 0.06 ml/min/g, $p < 0.05$).

Conclusions: Nicotine does not impair endothelium-dependent microvascular vasomotricity. Nevertheless, exposure to small amounts of nicotine increase aortic wave reflection and reduces resting myocardial perfusion in non-smokers.

P.002

HABITUAL ANTIOXIDANT VITAMIN INTAKE, AUGMENTATION INDEX AND FLOW MEDIATED DILATION IN HYPERTENSIVE PATIENTS AND NORMOTENSIVE CONTROLS

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Objective: We evaluated the association of daily dietary intake of antioxidants vitamins C and E with augmentation index and endothelial function in untreated essential hypertensive (HT) patients and normotensive (NT) subjects.

Methods: Dietary intake of major nutrients, total caloric intake and antioxidant vitamins were assessed with the Italian EPIC questionnaire in 200 untreated HT patients and 130 NT subjects. Augmentation index (AIx) was determined with radial applanation tonometry. Endothelium-dependent response was assessed as flow mediated dilation (FMD) of the brachial artery by high resolution ultrasounds and computerized analysis (automatic edge detection system) of brachial artery diameter modifications.

Results: AIx was significantly higher in HT patients ($26.9 \pm 9.6\%$) as compared to NT subjects ($20.4 \pm 11.3\%$), whereas FMD resulted significantly lower (5.0 ± 2.5 vs 6.2 ± 2.7 ; $p < 0.001$). Calculated intake of vitamin C and E was similar in HT patients and in NT subjects (Vitamin C median 146.4 ± 68.7 mg/day and 149.1 ± 84.0 mg/day, Vitamin E median 8.68 ± 2.7 mg/day and 8.63 ± 2.9 mg/day, respectively). Multivariate analyses were controlled for smoking, physical activity status and total caloric intake. In both groups, levels of Vitamin C or E intake were not significant predictors for AIx. Finally, in both groups, levels of Vitamin C or E intake were not significant predictors for FMD.

Conclusions: No association exists between normal levels of regular food antioxidant intake, augmentation index and endothelial function in untreated essential hypertensive patients and normotensive subjects. This

suggests that supplementation with vitamin C and E is necessary to show an effect on vascular function in this population.

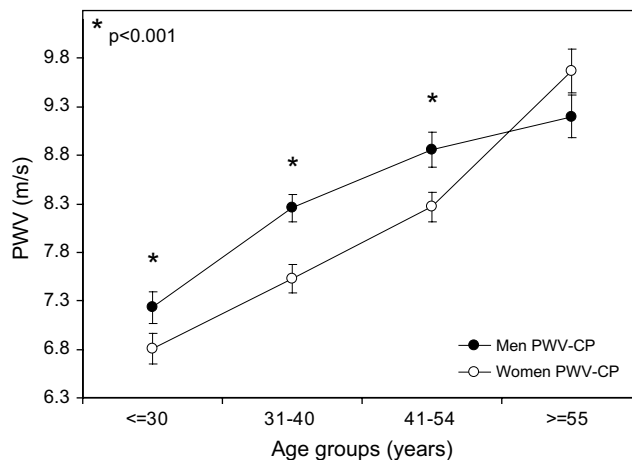
P.003

EFFECTS OF AGING ON PULSE WAVE VELOCITY IN AFRICAN MEN AND WOMEN

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Background: The pulse wave velocity (PWV) in Caucasian men and women is similar and show similar increases with aging. But women develop a greater pulse pressure (PP) with aging due to smaller body size (since the height, weight and DBP are higher in men)[1]. Africans have a smaller body size than Caucasians, and African women are shorter and usually more obese than men. **Aim:** To compare age-related changes in PWV of African men and women. **Methods:** In 182 African men and 192 women (aged 20 to 77 years), carotid-radialis (C-R) and carotid-dorsalis pedis (C-P) PWV determined with the Complior SP. Anthropometric measurements were also done.

Results: As expected women weighed significantly more than men and were shorter than men ($p < 0.001$). Similar SBP, DBP and PP were shown for men and women (whole group), and in all age groups (except 31-40 yrs). PWV (adjusted for BP, obesity) was overall higher ($p < 0.001$) in men than women, also in most age groups. Only the eldest female group showed a trend to have higher C-P PWV than men.



Conclusion: Africans show contrasting results compared to Caucasians, namely significant gender differences in distensibility of the peripheral arterial tree, which seems to disappear after menopause. [1] Smulyan et al. JACC 2001; 37:1374-80.

P.004

ETHNIC DIFFERENCES IN PULSE WAVE VELOCITY AND ITS RELATION TO BLOOD PRESSURE

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Introduction: It is known that African men suffer from high BP and vascular dysfunction. Normally a correlation exist between PWV and BP. However some studies show changes in PWV, independent of BP, possibly as a result of vascular remodeling [1].

Aim: To compare PWV in subjects of African and Caucasian ethnicity and its relation to BP.

Method: The study included 74 Caucasian and 64 African men from South Africa (aged 45-65 years). Cardiovascular parameters were recorded with the Finometer. The Complior SP was used to measure the carotid-radialis PWV.

Results: DBP and MAP were significantly higher in the Africans. SV and arterial compliance were significantly lower in the Africans but the TPR was significantly higher- an indication of vascular dysfunction. In the Africans the PWV was significantly higher than in the Caucasians (11.2 m/s vs 10.6 m/s). With the Bonferroni test (corrected for BP) the same results were found. In the