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### **P107: RENAL DENERVATION IMPROVES 24-HOUR CENTRAL AND PERIPHERAL BLOOD PRESSURES, ARTERIAL STIFFNESS AND PERIPHERAL RESISTANCE**

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**Background and Objectives:** It is known that physical activity is inversely associated with arterial stiffness in healthy adults<sup>1</sup>. Data regarding the effect of physical activity on PPA is limited. Such data is of importance especially in South Africa, where alarming rates of physical inactivity have been reported<sup>2,3</sup>. The aim of this study was to determine the relationship between pulse pressure amplification (PPA) and physical activity in a young, healthy black and white South African cohort.

**Methods:** The sub-study was embedded in the African Prospective study on the Early Detection and Identification of Cardiovascular disease and Hypertension (African-PREDICT) and included 591 white and 604 black participants aged 20–30 years. Systolic, diastolic and central blood pressures were determined with the SphygmoCor apparatus. Biochemical variables were analysed with known methods.

**Results:** The SBP (124 vs. 121 mmHg,  $p < 0.001$ ), DBP (76 vs. 71 mmHg,  $p < 0.001$ ) and central SBP (110 vs. 105 mmHg,  $p < 0.001$ ) were significant higher in the black compared to white participants. No differences were encountered in c-fPWV and PPA. The physical activity levels did not differ but the total energy expenditure was significant lower in the blacks compared to whites (2205.5 vs. 2373.6 kCal,  $p < 0.001$ ). After multiple regression analysis only in black participants the PPA showed an independent and significant negative association with age ( $\beta = -0.282$ ,  $p < 0.001$ ) and a positive association with height ( $\beta = 0.247$ ,  $p < 0.001$ ). In whites the PPA only associated positively with sex ( $\beta = 0.180$ ,  $p = 0.032$ ).

**Conclusion:** No association was encountered between arterial stiffness (PPA) and physical activity markers.

#### References

1. O'Donovan C, Lithander FE, Raftery T, Gormley J, Mahmud A, Hussey J. Inverse relationship between physical activity and arterial stiffness in adults with hypertension. *J Phys Act Health*. 2014;11(2):272-277.
2. Laughlin MH, Newcomer SC, Bender SB. Importance of hemodynamic forces as signals for exercise-induced changes in endothelial cell phenotype. *J Appl Physiol*. 2008;104(3):588-600.
3. Matsuda M, Nosaka T, Sato M, Ohshima N. Effects of physical exercise on the elasticity and elastic components of the rat aorta. *Eur J Appl Physiol Occup Physiol*. 1993;66(2):122-126.

#### P106

##### RELATIONSHIP BETWEEN CENTRAL PULSE PRESSURE AND URINARY SODIUM EXCRETION IN A POPULATION-BASED STUDY IN SALVADOR, BRAZIL, PRELIMINARY RESULTS

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**Introduction:** Central Pressure (PC) has shown to be more reliable in cardiovascular (CV) mortality (1); Salt intake and excretion seems to lead to an increase in this pulsatile component of the arterial flow (2, 3). Central Pulse Pressure (PPc) data is very few.

**Methods:** A population-based cross-sectional study representative of a poor and mixed-race neighborhood of Salvador-B A, Brazil, distributed in 12 census tracts according to the Brazilian Institute of Geography and Statistics. The overall sample is randomized in adults from the assigned area, from December 2016 to May 2018 comprise 110 people. Individual and household records are filled out. The central pressure, measured in the radial artery, obtained through aplanation tonometry, using the SphygmoCor<sup>®</sup> (XCEL, AtCor Medical, Sydney, Australia (2)), with operation index  $\geq 85\%$ . PP c measured by systolic central pressure minus diastolic central pressure. 24-hour urine samples were collected. Urinary sodium (US) measured by the selective ion electrode, ADVIA1800<sup>®</sup> (SiemensHealthcare Japan/Canada). The committee for research on human subjects of the FTC approved the protocol

(No1827621). Median, interquartile range, Spearman's linear correlation coefficient between PPc and sodium stratified by sex, using STATA v.12 software for data base management and statistical analysis. The level of statistical significance was set at 5%.

**Results:** 71,8% female, mean age  $49,7 \pm 16y$ . Median excretion rate of sodium was, in male,  $133,2 \pm 82$  mEq/l (In general  $126,4 \pm 84$ ). In male was a significant negative correlation ( $r = -0,43$ ;  $p = 0,01$ ) between PPc and US excretion.

**Conclusion:** There was a correlation between the values of PPc and UR in men (fig.1). These results need future best understanding.

#### References

1. Roman MJ, Devereux RB, Kizer JR et al. Central Pressure More Strongly relates to Vascular Disease and Outcome Than Does Brachial Pressure. *The Strong Heart Study.Hypertension*.2007; 50:197-203.
2. Laatikainen T, Pietinen P, ValstaL. Et al. Sodium in the Finnish diet: 20-year trends in urinary sodium excretion among the adult population. *Eur.J. Clin. Nutr*.2006;60:965-970.
3. Redelinghuys M, Norton GR, Scott L. et al. Relationship between Urinary Salt Excretion and Pulse Pressure and Central Aortic Hemodynamics Independent of Steady State Pressure in the General Population. *Hypertension*, 2010; 56:584-590. Lucelia C. Magalhães, Daniele, Diordene da Silva1 Rodrigo L. Sant'Ana de Lima1 Antonio O. Alves Filho 2, Roberta C. A Cunha. Jamile Gomes, Raquel C. Dantas1.

#### Poster Session II – Hypertension III

##### P107

##### RENAL DENERVATION IMPROVES 24-HOUR CENTRAL AND PERIPHERAL BLOOD PRESSURES, ARTERIAL STIFFNESS AND PERIPHERAL RESISTANCE

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**Background:** Ambulatory Blood Pressure (BP) as well as central BP are better predictors for overall cardiovascular risk and mortality than brachial BP. Renal Denervation (RDN) has been shown to reduce office brachial and central BP as well as ambulatory brachial BP, but data on central ambulatory BP are limited. We therefore aimed to study the effect of RDN also on central hemodynamics assessed under ambulatory conditions.

**Methods:** In total 94 patients with treatment resistant hypertension (TRH) (office BP  $\geq 140/90$  mmHg, and diagnosis confirmed by mean daytime brachial ambulatory BP  $\geq 135/85$  mmHg) who underwent RDN (using Medtronic Symplicity™ RDN radiofrequency ablation catheter system) were included. Ambulatory BP, including central pressures, hemodynamics and arterial stiffness, were measured at baseline and 3, 6, 12 months after RDN by an oscillometric device (MobiloGraph™, I.E.M., Germany).

**Results:** Office BP was significantly reduced at all time points ( $p$  for all  $< 0.001$ ). At 3, 6 and 12 months follow-up, brachial ambulatory BP was reduced by  $6 \pm 13/4 \pm 7$  mmHg,  $8 \pm 15/4 \pm 10$  mmHg,  $9 \pm 16/4 \pm 9$  mmHg, respectively ( $p$  for all  $< 0.001$ ). Consistently, central ambulatory BP was reduced by  $6 \pm 12/3 \pm 8$  mmHg,  $7 \pm 15/4 \pm 9$  mmHg,  $9 \pm 15/5 \pm 9$  mmHg, respectively ( $p$  for all  $< 0.001$ ). In addition, ambulatory assessed averaged daytime pulse wave velocity improved after RDN ( $p < 0.05$ ). Total vascular resistance decreased by  $4.0\%/5.5\%/6.7\%$  ( $p$  for all  $< 0.01$ ). In contrast, cardiac output was not altered during follow-up.

**Conclusion:** In patients with TRH, RDN improves brachial and central ambulatory BP, arterial stiffness and total vascular resistance, indicating an improvement of cardiovascular outcome.