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### **14.6: RELATIONSHIP BETWEEN 24-HOUR BLOOD PRESSURE VARIABILITY AND 24-HOUR CENTRAL ARTERIAL PRESSURE, PULSE WAVE REFLECTION AND STIFFNESS IN HYPERTENSIVE PATIENTS**

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**Results:** After 3 months of KTx, angptl2 levels decreased from 71 ng/mL (IQR: 53-95) to 11 ng/mL (IQR: 9-15)  $P < 0.001$ . In multivariate analysis, age, CVD, lower renal function and mean blood pressure were independently associated with higher angptl2 levels. There was a positive relationship between cf-PWV and angptl2 after KTx ( $r = 0.260$   $P = 0.024$ ). After a median follow-up of 89 months, 13 deaths occurred. The group with higher angptl2 levels had a higher mortality rate (HR = 0.249 95% CI: 0.068-0.912,  $P = 0.036$ ).

**Conclusion:** There is a significant reduction in serum angptl2 levels after KTx however, our data demonstrate that after KTx, there is a positive association between angptl2, aortic stiffness and mortality, suggesting that angptl2 may play a biological role in CKD-related CVD.

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#### 14.6

##### RELATIONSHIP BETWEEN 24-HOUR BLOOD PRESSURE VARIABILITY AND 24-HOUR CENTRAL ARTERIAL PRESSURE, PULSE WAVE REFLECTION AND STIFFNESS IN HYPERTENSIVE PATIENTS

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**Objective:** Twenty-four-hour blood pressure variability (BPV) predicts cardiovascular complications in hypertension, but its association with pulse wave indices (central arterial systolic pressure or CASP, pulse wave velocity or PWV, and augmentation index or AIX) is poorly understood. In the present study we assessed the degree of the impact of 24-hour BPV on 24-hour pulse wave indices.

**Methods:** Brachial BP was measured non-invasively over the 24-hours by an electronic, oscillometric, automated device (BPLab) in 661 uncomplicated, treated or untreated, hypertensive patients. Digitalized oscillometric waveforms were analyzed by a validated algorithm in order to obtain pulse wave indices. Twenty-four-hour BPV was calculated as unweighted (SDu) or weighted standard deviation (SDw) of the mean blood pressure, or as average real variability (ARV). Patients were classified in two groups according to whether the 24-hour BPV was below or above the median of the whole group.

**Results:** Twenty-four-hour systolic blood pressure variability (SBPV) showed a direct and significant relation with CASP ( $r = 0.28$  SDu,  $r = 0.40$  SDw,  $r = 0.34$  ARV), aortic PWV ( $r = 0.10$  SDu,  $r = 0.21$  SDw,  $r = 0.19$  ARV) and AIX ( $r = 0.17$  SDu,  $r = 0.27$  SDw,  $r = 0.23$  ARV). After adjustment for age, gender, body mass index, antihypertensive treatment and 24-hour SBP, the relationship was attenuated, but was still significant for all measures, X for AIX. Pulse wave indices were larger in patients with high than in those with low BPV: after adjustment these differences were abolished for AIX. Diastolic BPV showed a weak association with pulse wave indices.

**Conclusions:** In hypertensive patients 24-hour SBPV is moderately and independently associated with 24-hour CASP, wave reflection and stiffness.

#### 14.7

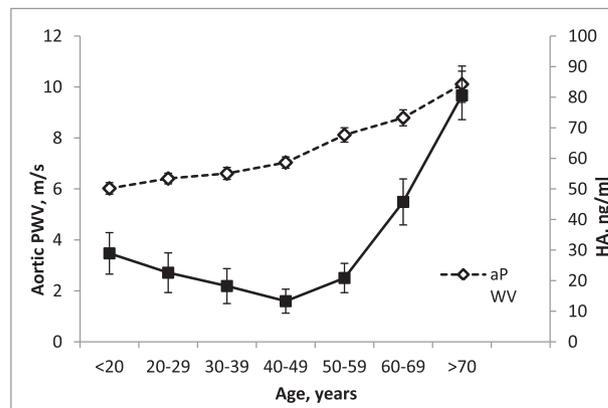
##### HYALURONAN IS ASSOCIATED WITH AORTIC STIFFENING IN HEALTHY SUBJECTS

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**Background:** Over-expression of hyaluronan (HA), glycosaminoglycan found in the extracellular matrix, results in the stiffening of the arterial wall by thinning of elastic lamellae in animal models. However, the effect in human arteries is more contentious. We aimed to study the relationship between serum HA and aortic stiffness in a cohort of healthy subjects.

**Methods:** Subjects were randomly selected from the Anglo-Cardiff Collaborative Trial (ACCT) database. Subjects underwent detailed haemodynamic assessment, including measurements of blood pressure (BP) and aortic pulse wave velocity (aPWV) (SphygmoCor, AtCor, Australia). Serum HA levels were measured by commercially available ELISA kit (DY3614, R&D Systems, U.K).

**Results:** 155 individuals (73 females and 82 males), with a mean age of  $44 \pm 19$  years, and a mean of BP of  $134 \pm 16 / 86 \pm 11$  mmHg were studied. HA and aPWV both increased with aging ( $P < 0.0001$  for both see the figure). Subjects were then split into tertiles of serum HA. aPWV was positively associated with HA tertile ( $7.03 \pm 1.42$  v.  $7.57 \pm 1.69$  v.  $8.10 \pm 2.00$  m/s  $P = 0.002$ ). In multiple regression analysis, we found that HA remained independently associated with aPWV after adjusting for mean arterial pressure, BMI and gender (model  $R^2 = 0.233$ ,  $P < 0.001$ ).



**Conclusions:** Our data suggests that hyaluronan may be one of the factors behind age-related aortic stiffening. However, further studies are needed to establish whether this association is causal and to understand the mechanism behind it.

#### 14.8

##### VASCULAR ABNORMALITIES RELATED WITH OBESITY

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**Environment and Objectives:** Obesity is linked to a higher prevalence of risk factors, metabolic and inflammatory pathways conducting to increased vascular disease and CV risk.

To assess vascular disarrangements using non invasive methods in obese subjects (O) compared with matched lean (L) controls.

**Methods:** From the database of our Non Invasive Vascular Lab with 3964 first evaluated patients, we performed a case control study with 363 subjects, 268 obese and 95 lean age and sex matched controls. We measured IMT, Plaque analysis, PWV, Endothelial Function (EF) and arterial stiffness (CAP and AIX) (AS) using an oscillometric device (Arteriograph, Tendimed, Hungary).

**Results:** Age (O  $42.5 \pm 5$  L  $43.5 \pm 11$ ) and sex (O 80.6% L 78%) were similar. BMI (O  $33.5 \pm 3.3$  L  $25 \pm 1.1$  Kg/m<sup>2</sup>), waist (O  $110.4 \pm 7.5$  L  $91.2 \pm 6.1$  cm) and BP (SBP O  $139.8 \pm 16.8$  L  $119 \pm 8.8$  and DBP O  $89 \pm 3.9$  L  $74.3 \pm 8$  mmHg) were higher in O ( $p < 0.001$ ). CV Risk Factors in O: HTN 68% DLP 59.7% SMKG 24.2% DBT2 7.8% SED 72.4%. The proportion of abnormalities in IMT (O/L : 65.8/25.3%), Plaques (75.6/38.9%), EF (57.5/33.7%) and PWV (41.4/17.9%) were higher in O ( $p < 0.001$ ). Central and Peripheral PP were higher in O but not AIX.

**Conclusion:** Obese patients present a higher prevalence of vascular disarrangements although structural and functional explaining the role of this condition as a CV risk factor.

#### 14.9

##### INCREASED ARTERIAL STIFFNESS PREDICTS LESS RECOVERY OF LEFT VENTRICULAR SYSTOLIC FUNCTION AFTER MYOCARDIAL INFARCTION

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**Objective:** Left ventricular (LV) remodeling may occur following myocardial infarction. Estimate the likelihood of remodeling from the state of the infarcted may with speckle tracking echocardiography (STE). Research