P57: ASSESSMENT OF PULSE WAVE VELOCITY AND ASSOCIATION TO TARGET ORGAN DAMAGE IN TREATMENT-NAÏVE HYPERTENSIVE PATIENTS: A COMPARISON OF SPHYGMOCOR AND MOBIL-O-GRAPH

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Abstracts

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Objectives: Six differences for parameters of arterial wave reflection and arterial stiffness were reported from single office measurements, but circular patterns were not extensively investigated up to now. The aim of this study was to determine sex differences between day and night values of ambulatory central blood pressure as well as ambulatory pulse wave parameters related to arterial wave reflection.

Methods: A Mobil-O-Graph (IEM, Stolberg) with inbuilt PWA technology was used in patients without antihypertensive treatment visiting a doctor’s practice for internal medicine. Aortic blood pressure was obtained using a generalized transfer function incorporating mean blood pressure for pressure calibration. Daytime was defined between 9 am and 8 pm and nighttime between 10 pm and 6 am.

Results: In the study 122 men (mean age 50.5 years) and 155 women (57.3 years) were included. Men had higher central systolic (cSBP) and diastolic blood pressures compared to women. In contrast, augmentation index (Alx) and reflection magnitude (RM) were significantly lower in men compared to women both during day and night. For both sexes, Alx and RM were higher during the night, see table for full details (all day-night differences were statistically significant).

Conclusions: A typical blood pressure dipping during nighttime was found for both sexes. However, an increase in wave reflection parameters was found during nighttime leading to highest values for women during the night. Thus, single measurements have to be interpreted with caution and an ambulatory blood pressure measurement including pulse wave analysis might be beneficial.

Table

<table>
<thead>
<tr>
<th>Mean values of both sexes during daytime and nighttime.</th>
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<tbody>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Men</strong></td>
</tr>
<tr>
<td>bSBP (mmHg)</td>
</tr>
<tr>
<td>dSBP (mmHg)</td>
</tr>
<tr>
<td>HR (bpm)</td>
</tr>
<tr>
<td>cSBP (mmHg)</td>
</tr>
<tr>
<td>Alx (%)</td>
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<tr>
<td>RM</td>
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</table>

*Indicates a significant difference between men and women (p<0.05); bSBP – brachial systolic blood pressure, dSBP – brachial diastolic blood pressure, HR – heart rate, cSBP – central systolic blood pressure, Alx – augmentation index, RM – reflection magnitude.

PS5

TARGET ORGAN DAMAGE AND BLOOD PRESSURE VARIABILITY IN HYPERTENSION

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Purpose/Background/Objectives: Hypertension is associated with several markers of subclinical target organ damage (TOD). Short-term blood pressure variability (SBPV) is a prognostic factor for cardiovascular events in hypertensives. We hypothesised that there is a relationship between SBPV and TOD in never-treated hypertensives.

Methods: We enrolled 943 consecutive essential hypertensives (mean age 53 ± 12 years, 497 males). Markers of subclinical TOD (left ventricular mass index (LVMI), pulse wave velocity (PWV), total arterial compliance (TAC), aortic augmentation index (Alx@75), ankle-brachial index (ABI) and estimated glomerular filtration rate (eGFR)) and 24-h ambulatory blood pressure were evaluated in all patients. SBPV was calculated as follows: 1) SD of 24-hour, daytime, or nighttime SBP and 2) weighted SD of 24-hour SBP.

Results: In multivariable regression analysis, all four variables of SBPV exhibited significant association with LVMI (p = 0.014, p = 0.002, p < 0.001, respectively), PWV (p = 0.021, p = 0.015, p = 0.055 and p = 0.006, respectively) and TAC (p = 0.048, p = 0.020, p = 0.036 and p = 0.006, respectively). In multivariable analysis, ABI and eGFR were not associated with indices of SBPV. We assessed TOD based on 2013 European Guidelines for Hypertension [left ventricular hypertrophy (LVMI > 115 g/m² in men and >95 g/m² in women), increased PWV (PWV > 10 m/s), increased Alx@75 (Alx@75 > 28%), decreased ABI (ABI < 0.9) and decreased renal function (eGFR < 60 ml/min)]. In multivariable logistic regression analysis, SBPV indices were not associated with markers of TOD (p > 0.05).

Conclusions: Our findings support a complex relationship between SBPV and TOD in hypertension. Specifically, SBPV is more closely related to markers of ventricular and vascular compliance than other markers of TOD in hypertension.

PS6

ASSOCIATION BETWEEN URIC ACID AND CARDIAC, VASCULAR AND RENAL TARGET ORGAN DAMAGE IN HYPERTENSIVE SUBJECTS

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Background: To date no definitive results exist about the relationship of Serum Uric Acid (SUA) and TOD in HT subjects. We sought to determine if such an association exist between SUA and subclinical cardiovascular, vascular and renal alterations in HT.

Methods: We enrolled 632 consecutive outpatients, followed by the Hypertension Unit of S. Gerardo Hospital (Monza, Italy) affected by essential HT. We evaluated anamnestic data, clinical BP and laboratory data as well as TOD with cardiac echocardiography (both as LVM and diastolic function – E/A), carotid ultrasound (IMT), arterial stiffness (PWV) and renal function analysis (creatinine and microalbuminuria).

Results: Age was 53.4 ± 12.7 years, SBP/DDBP were 140.5 ± 18.8 and 85.1 ± 13.1 mmHg and SUA was 5.2 ± 1.4 mg/dL. Regarding TOD mean LVM was 109.6 ± 31.4 g/m², IMT 0.7 ± 0.1 mm, PWV 8.5 ± 2.2 m/s, while creatinine and microalbuminuria were 0.8 ± 0.2 mg/dL and 25.4 ± 126.1 mg/24h respectively. When subjects were divided into high and low SUA group (depending on the median SUA of 5.2 mg/dL), with similar age and BP values the first group showed significantly higher values of metabolic index (BMI, HDL chl, triglycerides and glucose, p < 0.001), LVM (117.1 ± 32.8 vs 102.1 ± 28.1 g/m², p < 0.01), IMT (0.73 ± 0.1 vs 0.70 ± 0.1 mm, p = 0.04), PWV (8.8 ± 2.4 vs 8.3 ± 1.1 m/s, p = 0.01) and creatinine (0.9 ± 0.2 vs 0.7 ± 0.1 mg/dL, p < 0.01) and lower E/A (1.0 ± 0.3 vs 1.1 ± 0.3, p = 0.01).

Conclusion: In HT, SUA values correlate with metabolic derangements and with cardiac, vascular and renal TOD. The most significant correlation is with renal damage.

PS7

ASSESSMENT OF PULSE WAVE VELOCITY AND ASSOCIATION TO TARGET ORGAN DAMAGE IN TREATMENT-NAÏVE HYPERTENSIVE PATIENTS: A COMPARISON OF SYPHYGMOCOR AND MOBIL-O-GRAF

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Introduction: Comparison of Mobil-O-Graf® with SphygmoCor® exclusively in treatment-naïve hypertensives has never been done. Aims of the study were to assess 1) intra- device agreement between both methods, 2) inter-device agreement between two surface measurements of SC (subtracted distance (cFPWVsusb)) and direct distance > 0.8 (cFPWVo.8)) with two patient's positions of MG (supine (surfPWVestim)) and sitting (sitPWVestim)), 3) the strength of association between tonometric and oscillometric measures of PWV with target organ damage (TOD).

Conclusions: Our findings support a complex relationship between SBPV and TOD in hypertension. Specifically, SBPV is more closely related to markers of ventricular and vascular compliance than other markers of TOD in hypertension.

Conclusions: In HT, SUA values correlate with metabolic derangements and with cardiac, vascular and renal TOD. The most significant correlation is with renal damage.
Methods: Cross-sectional, observational study in 171 consecutive, treatment-naive subjects derived to a Hypertension Unit with suspected hypertension. Standard echocardiography, ECG, carotid ultrasound and laboratory tests were performed.

Results: Mean age was 49.7 years, 57.3% were women. Reproducibility: Mean differences ±SD of the difference (SDD) between duplicate SC and MG PWV measurements were non-significant. Agreement: cfPWV0.8 yielded the highest PWV values (8.17±1.6 m/s), followed by cfPWVsub (7.98±1.7 m/s), supPWVestim (7.83±1.7 m/s) and stiPWVestim (7.80±1.6 m/s). We observed significant mean differences only between cfPWV0.8 and all other PWV measures: with cfPWVsub (0.23 m/s, p = 0.001), with supPWVestim (0.19 m/s, p = 0.001) and with supPWVestim (0.38 m/s, p = 0.002). No significant correlation was found between the mean and the difference for PWV in any comparison.

Association with cardiac damage was highest with cfPWVsub, supPWVestim and stiPWVestim were more closely related to carotid damage, though differences were not significant.

Table 3. Differences between PWV measured by plethysmography according to two surface measurements and by brachial oscilometry according to supine ox sitting position.

<table>
<thead>
<tr>
<th>Comparison of PWV</th>
<th>Mean difference</th>
<th>CI</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>cfPWVsub–supPWVestim</td>
<td>0.16</td>
<td>-0.06/0.37</td>
<td>0.149</td>
</tr>
<tr>
<td>cfPWVsub–stiPWVestim</td>
<td>0.18</td>
<td>-0.03/0.39</td>
<td>0.098</td>
</tr>
<tr>
<td>cfPWV0.8–supPWVestim</td>
<td>0.38</td>
<td>0.15/0.62</td>
<td>0.002</td>
</tr>
<tr>
<td>cfPWV0.8–stiPWVestim</td>
<td>0.39</td>
<td>0.15/0.63</td>
<td>0.001</td>
</tr>
<tr>
<td>cfPWV0.8–cfPWVsub</td>
<td>0.23</td>
<td>0.12/0.35</td>
<td>0.000</td>
</tr>
<tr>
<td>supPWVestim–stiPWVestim</td>
<td>0.02</td>
<td>-0.07/0.12</td>
<td>0.635</td>
</tr>
</tbody>
</table>

P59
ARterial stifFness and peripheral vascular resistance in OffsetSspring of hypertensiVe parents — influence of gender and other confounders

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Aim: Established essential hypertension (EH) is associated with increased arterial stiffness and peripheral resistance, but the extent of vascular changes in persons genetically predisposed for EH is uncertain.

Methods: Participants from the Danish Hypertension Prevention Project (DHyPP) (having two hypertensive parents) (n = 95, 41 ± 1 year, 53% males) were compared to available spouses (n = 45, age 41 ± 1 years, 43% males). The subjects had measurements of ambulatory blood pressure (BP), left ventricular mass (LVM), pulse wave velocity (PWV), central BP and augmentation index (AIx) in addition to forearm resting and minimal resistance (Rrest and Rmin).

Results: DHyPP participants with and without spouses were comparable and the DHyPP cohort, as compared to spouses, had higher 24-hour mean BP (94 ± 1 vs. 88 ±1 mmHg, P < 0.01); (90 ± 2 vs. 80 ± 2 mmHg, P < 0.01), central systolic BP (119 ± 2 vs. 111 ± 2 mmHg, P < 0.01) and AIx (15.1 ± 1.2 vs. 10.5 ± 1.7%, P < 0.01), but similar values of carotid-femoral PWV (7.3 ± 0.1 vs. 7.1 ± 0.2 m/s), Rrest (51 ± 2 vs. 51 ± 3 mmHg/ml/min/100 ml), and log Rmin (0.07 ± 0.02 vs. 0.55 ± 0.02 mmHg/ml/min/100 ml). AIx, Rrest and Rmin were higher in female as compared to male DHyPP participants (P < 0.01 for all) and the same was true for AIx and Rmin among spouses (P < 0.05).

Using multiple linear regression analysis adjusting for gender, age, body mass index, 24-hour BP, 24-hour sodium excretion and creatinine clearance, AIx remained elevated in DHyPP subjects (3.4% [0.18; 6.60], P = 0.039). Furthermore, AIx was linearly associated with Rrest and Rmin.

Conclusion: Young to middle-aged individuals genetically predisposed for EH display increased AIx, while vascular stiffness and peripheral resistance are still normal.

P60
PSYchometrical determinants of target organ damage in hypertensive patients: focus on pulse wave velocity and depression

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Objective: Prior studies have suggested that the principal determinants of arterial stiffening are age, BP and other CV risk factors such as dyslipidemia