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IMPACT OF RENAL REPLACEMENT THERAPY ON PULSE PRESSURE AND LEFT VENTRICULAR HYPERTROPHY
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Objective: Cardiovascular complications are still the main cause of death in longterm transplant recipients. Left ventricular hypertrophy (LVH) and increased aortic stiffness - reflected by elevated pulse pressure (PP) - are predictors of cardiac death in patients with end-stage renal disease (ESRD). We evaluated the PP and LVH development, furthermore the association between calcineurininhibitor treatment (CNI), PP and LVH in ESRD and after transplantation.

Methods: 33 ESRD patients with CNI immunosuppression were examined clinically and echocardiographically before, and 3, 6, and 12 months after renal transplantation (RTX). We compared patients with and without LVH and also RTX patients to a control group of 33 patients with newly diagnosed borderline hypertension.

Results: Mean arterial bloodpressure (MAP) of ESRD patients did not differ from patients with borderline hypertension at baseline (MAP: 103.2 ± 2.0 vs. 106.3 ± 0.8 mmHg). After RTX (12 months) MAP did not change significantly. Left ventricular mass (LVM) was lower in controls as compared to the patients (LVM: 257.7 ± 16.0 vs. 313.0 ± 17.5 g, p<0.02). After RTX, LVM and LVMI decreased throughout the first year without reaching statistical significance. 17 patients did not show any regression of LVM (group A), while LVM decreased in 16 (group B) (D LVM: 9.8 ± 9.1 vs. −68.2 ± 13.7 g, p<0.05). Compared to A, group B showed significantly higher LVM, LVMI, and LV posterior wall thickness before RTX. LVM was not influenced by CNI troughlevels. D LVM in group B was significantly influenced by PP(p=0.04).

Conclusion: ESRD patients who suffer a strong LVH during hemodialysis therapy profit of a significant LVM regression after RTX with CNI immunosuppression. Pulsepressuer e.g. aortic stiffness influence the development of LVM and may serve as a predictor of cardiac outcome after RTX.

Key Words: Pulse Pressure, Cardiac Hypertrophy, Posttransplant Hypertension

P-373
CHANGES IN HEMODYNAMIC PATTERNS WITH AGE IN NORMOTENSIVE SUBJECTS
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Hypertension prevalence increases with advancing age, accompanied by increasing arterial stiffness. Whether comparable vascular changes occur in normotensive individuals with aging is not known.

We examined blood pressure (BP, oscillometric), heart rate (HR) and hemodynamic parameters (stroke volume SV, cardiac output CO, systemic vascular resistance SVR, by thoracic bioimpedance) by age decade in 640 normal subjects evaluated as renal donors. Those with hypertension (>140/90 mmHg or antihypertensive medication), renovascular or renal disease were excluded. Mean age was 41 ± 1 years (range 18-72), with 256 males, 384 females. Systolic and diastolic BP rose with age. CO declined, mediated by lower SV while HR was unchanged. SVR increased progressively with age. Trends were similar when hemodynamic measurements were indexed to body surface area. Absolute impedance rose with age as did impedance change with posture. While BP and CO were lower and HR and SVR higher in women compared to men, hemodynamic changes with age occurred in parallel. Once indexed to BSA, CO and SVR measures did not differ by gender even though BP was lower in women.

Mean ± SEM. * p < 0.05 vs age 18–30, † p < 0.05 vs age 31–40, ‡ p < 0.05 vs age 41–50. TFI: supine thoracic impedance, ΔTFI: impedance change with posture.

Our results indicate a prevailing age-related rise in vascular tone mediates higher BP with advancing age in association with normal to low cardiac pulmonary volume. As CO falls, BP rise is mediated by accentuated systemic vasoconstriction. This may result in declining perfusion to multiple vascular beds including the kidney, accounting for the decline in glomerular filtration rate seen with aging via reduced renal blood flow.

Key Words: Aging, Hemodynamics, Vascular Disease

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CIRCULATING TISSUE INHIBITOR OF METALLOPROTEINASE-1 ELEVATION CORRELATES WITH IMPAIRED DIASTOLIC RELAXATION IN PATIENTS WITH HYPERTENSION
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Hypertension(HBP), hypertensive heart disease and left ventricular (LV) hypertrophy are integral to symptomatic diastolic heart failure. Tissue inhibitor of metalloproteinase 1 (TIMP-1) is linked to extracellular matrix fibrosis and is elevated in HBP. We explored the link between circulating TIMP-1, matrix metalloproteinase 9 (MMP-9) and resting echocardiographic LV filling.

Circulating MMP-9 and TIMP-1 levels were measured in citrated plasma by ELISA in 74 patients with HBP (58 male, age 58 ± 11yrs) and 34 controls (23 male, age 53 ± 3years) with normal systolic function.

There were significant differences in many of the parameters reflecting diastolic dysfunction, and both MMP-9 and TIMP-1 were higher in the hypertensive group (Table). Within the hypertensive cohort, only TIMP-1 correlated with left ventricular mass index (r=0.323, p=0.007) and tissue Doppler parameters of diastolic dysfunction (e’ (r=−0.338, p=0.005), a’ (r=−0.350, p=0.005) and e/e’ (r=−0.334, p=0.005).

TIMP-1 is thought to increase tissue concentrations of collagen type I by preventing its breakdown by matrix metalloproteinases. Our findings therefore add weight to a hypothesis suggesting that TIMP-1 may be a key mediator of left ventricular diastolic dysfunction through definition of the ventricular matrix composition.

Baseline Characteristics (Mean±SD) or Median (IQR)

<table>
<thead>
<tr>
<th>Age, years</th>
<th>18–30</th>
<th>31–40</th>
<th>41–50</th>
<th>51–60</th>
<th>61–72</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>107</td>
<td>205</td>
<td>207</td>
<td>92</td>
<td>29</td>
</tr>
<tr>
<td>Systolic BP, mmHg</td>
<td>117 ± 1</td>
<td>119 ± 1</td>
<td>119 ± 1</td>
<td>123 ± 2†</td>
<td>123 ± 2†</td>
</tr>
<tr>
<td>Diastolic BP, mmHg</td>
<td>69 ± 1</td>
<td>73 ± 1*</td>
<td>73 ± 1*</td>
<td>73 ± 1*</td>
<td>74 ± 1*</td>
</tr>
<tr>
<td>SV, ml/b</td>
<td>98 ± 2</td>
<td>96 ± 2*</td>
<td>94 ± 2</td>
<td>80 ± 2†</td>
<td>80 ± 2†</td>
</tr>
<tr>
<td>CO (l/min)</td>
<td>6.7 ± 0.12</td>
<td>6.70 ± 0.09</td>
<td>6.52 ± 0.10</td>
<td>6.10 ± 0.14†</td>
<td>5.68 ± 0.22†</td>
</tr>
<tr>
<td>SVR, (d-sec-cm)</td>
<td>1041 ± 18</td>
<td>1075 ± 15</td>
<td>1145 ± 20†</td>
<td>1216 ± 28‡</td>
<td>1316 ± 50‡</td>
</tr>
<tr>
<td>TFI, ohms</td>
<td>28 ± 0.6</td>
<td>29 ± 0.4</td>
<td>31.4 ± 0.4*</td>
<td>32.7 ± 0.6*†</td>
<td>33.8 ± 1.2*†</td>
</tr>
<tr>
<td>STHL, ohms</td>
<td>4.8 ± 0.4</td>
<td>4.1 ± 0.1</td>
<td>4.0 ± 0.1</td>
<td>5.3 ± 0.8*</td>
<td>5.4 ± 0.5</td>
</tr>
</tbody>
</table>

Mean ± SEM. * p < 0.05 vs age 18–30, † p < 0.05 vs age 31–40, ‡ p < 0.05 vs age 41–50. TFI: supine thoracic impedance, ΔTFI: impedance change with posture.

Key Words: Tissue Inhibitor of Metalloproteinase, Diastolic Dysfunction, Hypertension

Key Words: Age, Hemodynamics, Vascular Disease

SBP, Systolic Blood Pressure; DBP, Diastolic Blood Pressure; LV, Left Ventricular