Abstract: **P6001**

**Inflammation, coronary microvascular function and diastolic function - Is there a link?**

**Authors:**
H E Suhrs¹, J Schröder¹, K B Bove¹, N D Mygind¹, D Frestad¹, M M Michelsen¹, T Lange², I Gustafsson¹, J Kastrup³, E Prescott¹, ¹Bispebjerg University Hospital, Cardiology - Copenhagen - Denmark, ²University of Copenhagen - Copenhagen - Denmark, ³Rigshospitalet - Copenhagen University Hospital - Copenhagen - Denmark,

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Coronary Circulation, Flow, and Flow Reserve

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**Background:** It has been proposed that multiple comorbidities including diabetes, hypertension and dyslipidemia contribute to a pro-inflammatory state that induces oxidative stress in the microvascular endothelium, leading to coronary microvascular dysfunction (CMD) and cardiac diastolic dysfunction.

**Purpose:** We tested the hypothesis that subclinical inflammation is an underlying cause of both CMD and diastolic dysfunction and that the effect of inflammation on diastolic function is partly mediated by CMD.

**Methods:** In a cross-sectional study design, we included women with angina but no flow limiting coronary artery stenosis (180 with diabetes, 156 without diabetes) and 95 asymptomatic controls. Blood samples were analysed for 91 mainly inflammatory cardiovascular biomarkers. Coronary microvascular function was assessed as coronary flow velocity reserve (CFVR) by transthoracic Doppler echocardiography. Correlation of each biomarker with CFVR and E/e’ as a marker of diastolic function, was examined by age adjusted linear regression and mediation analysis was conducted to assess if any effect of inflammation on E/e’ was mediated by impaired CFVR.

**Results:** CFVR was lowest in patients with diabetes and highest in controls and, conversely, E/e’ was highest in patients with diabetes (both test for trend p<0.001). Of the 91 biomarkers, 29 had a significant negative correlation with CFVR, 26 had a significant positive correlation with E/e’ and 14 were associated with both CFVR and E/e’. CFVR and E/e’ were correlated in a subgroup of patients with more pronounced CMD and higher E/e’ (p=0.012) but not in the total population (p=0.818). A mediation analysis did not indicate that any effect of inflammation on E/e’ was mediated by impaired CFVR.

**Conclusion:** This is the first study to link a large number of mainly inflammatory biomarkers to CMD and diastolic dysfunction in patients suspected of microvascular angina. Direct association between CMD and diastolic function was only seen in those with impaired CFVR and poorest diastolic function.

<table>
<thead>
<tr>
<th></th>
<th>Diabetes (n=180)</th>
<th>No diabetes (n=156)</th>
<th>Control (n=95)</th>
<th>p for trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean (min, max)</td>
<td>64 (36,80)</td>
<td>62 (32,80)</td>
<td>61 (32.81)*</td>
<td>0.003</td>
</tr>
<tr>
<td>BMI, mean (min, max)</td>
<td>30.7 (15.2, 45.5)</td>
<td>26.1 (18.6,40.0)*</td>
<td>24.7 (18.6,38.4)*</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Hypertension, n (%)</td>
<td>133 (75%)</td>
<td>85 (55%)*</td>
<td>15 (18%)*</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>CFVR, median (IQR)</td>
<td>2.22 (1.90, 2.56)</td>
<td>2.35 (1.96, 2.74)</td>
<td>2.63 (2.22, 3.08)*</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>E/e’ ratio, median (IQR)</td>
<td>9.79 (8.14, 12.21)</td>
<td>8.07 (6.85, 9.95)*</td>
<td>7.86 (6.89, 9.58)*</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Population characteristics compared across groups with trend test (unadjusted linear regression). *p<0.005
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compared with the diabetes group. BMI: body mass index, CFVR: coronary flow velocity reserve.