aortic aneurysm compared to persons with a tricuspid aortic valve (TAV). Previ-
ous research has reported on differences in aneurysm formation between BAV
and TAV but underlying mechanisms have not been adequately delineated. We
focused on structural differences between the ascending aortic wall of patients
with BAV without dilatation (BA) compared to the normal aortic wall (TA) in TAV to
determine increased susceptibility.

Methods: Biopsies of the ascending aortic wall were divided in four groups: BAV
(n=38) and TAV (n=36) without (BA and TA) and with (BA and TAA) dilatation.
The unique BA group, represented early lesions rather than end-stage disease.
General aortic wall architecture was assessed histologically. We investigated vas-
cular smooth muscle cell (VSMCs) maturation immunohistochemically for the
expression of smooth muscle alpha (SM22a), smoothelin and calponin as mark-
ers for fully differentiated VSMCs, and alpha smooth muscle actin (αSMA) as
marker for differentiation of myofibroblasts. Lamin A/C, playing a pivotal role in
the differentiation of VSMCs and the splicing variant progerin, indicative for age-
ning, were also studied. Finally, we investigated the role of the epidermidis
and epicardium derived cells (EPDCs) in aneurysm formation in BAV and TAV.

Results: Periaortical inflammation was significantly higher in the TAA compared
to the TA, BA and BAA groups (p<0.001). The intima was significantly thinner
in all specimens from the BAV group compared to TAV (p<0.01). Expression of
αSMA (p<0.05), SM22a (p<0.01) and calponin was significantly less in BA and
BAV compared to TA and TAA. Compared to TA the expression of smoothelin
was significantly less in the TAA group and nearly absent in the BA and BAA
group. Lamin A/C expression was lower in BAV compared to TAV. Solely in TA a
significant increase (p<0.05) in progerin expression was seen. Finally, epicardial
activity was significantly greater in TAA compared to BA (p<0.01).

Conclusions: We have shown that the aortic wall with BAV is intrinsically dif-
ferent from those with TAV. A thinner intima, less differentiated VSMCs, possibly
correlated with low lamin A/C expression, and less epicardial activity indicate a
relative immaturity of the aortic wall in BAV. This can cause weakness and the
reported aneurysm susceptibility seen at a younger age and in a more severe
form as compared to cases with TAV morphology.

P5681 | BENCH
Downregulated expression of genes involved in the ubiquinone biosynthesis pathway in cardiorenal syndrome is associated with histopathological changes of the mitochondria

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Purpose: Concomitant cardiac and renal dysfunction, cardio-renal syndrome (CRS), is a major growing problem in chronic heart failure (CHF) or chronic kidney disease (CKD) patients. We sought to elucidate the cardiomyocyte’s intracellular changes by utilizing a rat model for CRS.

Methods: Male Lewis rats underwent 5/6 nephrectomy, 4 weeks prior to induc-
tion of left ventricular dysfunction (LVD) by ligation of the left anterior descending
artery (LAD), allowing CKD development prior to the cardiac event. Five days
later total RNA, extracted from the ventricles, was subjected to Affymetrix GC
GeneChip array followed by real time validation analysis. Additional experimental
animals were sacrificed 6 weeks (short-term) or 8 months (long-term) post LAD
occlusion. Samples of cardiac tissue obtained from the left septum were fixed for
Transmission Electron Microscopy (TEM) processing in order to reveal intra-cellular
changes in the cardiomyocytes.

Results: The GeneChip array analysis demonstrated a significant down-
regulation of several ubiquinone biosynthesis genes in the CRS group compared
to CO CKD only. The TEM analysis demonstrated a massive internal reorganiza-
tion, among which, swollen-damaged mitochondria in the LVD and CRS
cardiac tissues compared to sham-operated controls or CKD-only samples (Fig-
ure). The swollen-damaged mitochondria were most abundant in the long-term
CRS group.

Abstract P5683 | Table 1

<table>
<thead>
<tr>
<th>Pathology</th>
<th>Control</th>
<th>CM</th>
<th>CV</th>
<th>CVCM</th>
<th>N</th>
<th>NCM</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degeneration in tubules epithelium</td>
<td>0.16±0.01a</td>
<td>1.56±0.34a</td>
<td>0.14±0.13a</td>
<td>0.29±0.18a</td>
<td>0.14±0.14a</td>
<td>0.28±0.18</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Dilatation of tubules</td>
<td>0.33±0.24a</td>
<td>1.16±0.16a</td>
<td>0.28±0.18b</td>
<td>0.14±0.14b</td>
<td>0.42±0.20</td>
<td>0.04±0.20</td>
<td>-0.05</td>
</tr>
<tr>
<td>Intestinal epithelium</td>
<td>0.53±0.21a</td>
<td>1.66±0.33a</td>
<td>0.00±0.50a</td>
<td>0.57±0.20a</td>
<td>0.57±0.20a</td>
<td>0.57±0.20a</td>
<td>-0.01</td>
</tr>
</tbody>
</table>

*Different letters indicate statistically significant differences in the same row.
levels were increased. Despite exposure to contrast medium, CVMC and NCM groups did not differ in terms of histopathological findings from control group. In CV group, interstitial inflammation and other histopathological findings were remarkably lower compared to the 0 group. MDA levels were decreased and TASS levels were significantly increased in CVMC and NCM compared to the CM group. Although not statistically significant, levels of SOD increased in both groups compared to the CM group.

Conclusion: This study demonstrated the protective role of carvedilol and nebivolol against CIN. Antioxidant properties of these drugs may have an effect in this.

P5684 | BEDSIDE
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Background: The aim of the study was to determine the role of endothelial function and inappropriate peripheral vasomotion in the pathogenesis of vasovagal syncope (VVS) in young patients.

Methods: We observed 50 pts (11 men, 39 women) aged 17-40 yrs (mean age 26.6 yrs) with suspected VVS referred to head-up tilt test (HUTT), with out any concomitant disorders – group I, and 30 matched healthy subjects (17 men, 23 women; mean age 28.7 yrs) – group II. In all subjects endothelium-dependent flow-mediated dilation (FMD) and endothelium-independent dilation (EID) were measured in the brachial artery by ultrasonography. A baseline rest image was acquired, and blood flow was estimated by pulsed Doppler measurement, then a midartery pulsed Doppler signal was obtained upon immediate cuff release to assess hyperemic velocity. After 10 min of rest next image was acquired to reflect the reestablished baseline conditions. Then a single dose (0.4 mg) of nitroglycerin (NTG) was given s.l. to determine the maximum obtainable vasodilator response as a measure of EID. Brachial artery Gosling’s Doppler Pulsatility Index (PI) and Puercelot’s Resistance Index (RI) were estimated. We estimated the changes of PI (dPI) and RI (dRI) during reactive hyperemia and after NTG administration. Standard HUTT (acc. to Westminster protocol) was performed in all pts with suspected VVS.

Results: HUTT was positive in 48 pts (96%). Mean values of FMD (18.77±2.87%) vs. 8.31±2.87%; p<0.000001) and EID (30.04±7.51% vs. 22.89±6.12%; p<0.000037) were significantly higher in gr.I than in gr.II. Significant differences of FMD and EID was observed also in pts with negative HUTT. There were no differences between pts with negative HUTT and healthy controls. PI was significantly higher in gr.I at rest (11.9±9.25 vs. 7.67±6.86; p<0.00126) and after NTG (15.5±13.93 vs. 11.99±14.99; p=0.003726) than in controls. Values of dPI were higher in gr.I, both during hyperemia (9.19±9.12 vs. 5.11±6.89; p<0.002801) and after NTG (85.32±168.13 vs. 26.13±48.78; p=0.002691) than in gr.II. Values of RI and dRI did not differ between studied groups.

Conclusions: The augmented endothelial function and inappropriate profound vasodilation of peripheral arteries play an important role in pathogenesis of VVS. Higher values of FMD and EID was observed also in pts with positive result of HUTT compared to negative result of HUTT and healthy subjects. Measurements of FMD, EID, PI and changes of PI seem to be helpful in diagnosis of VVS in young people.

P5685 | BENCH
High levels of arginine, citrulline and ADMA are independent predictors of cardiovascular disease

Purpose: Arginine is the sole nitrogen source for Nitric Oxide (NO) synthesis and citrulline is the major catabolic product of arginine. Arginine restores endothelial function in atherosclerotic patients, in whom there are elevated levels of Asymmetric Dimethylarginine (ADMA), an endogenous inhibitor of Nitric Oxide (NO) metabolism in the endothelial cell (NOS). In this study we investigated the relationship between ADMA levels and NO bioactivity, and cardiovascular disease (CVD) incidence in obese male patients. The objectives of this study were: (1) to investigate the relationship between ADMA levels and NO bioactivity, and cardiovascular disease (CVD) incidence in obese male patients.

Methods: A prospective case-control study derived from the population-based Malmö Diet and Cancer Cardiovascular Cohort (MDC-CC), all included subjects were without history of CVD at baseline. During 12 years of follow-up, 253 individuals had a CVD event and were matched for age, sex and lower levels of HDL cholesterol.

Conclusion: The increased expression of carboxylase activity in obese men may lead to a decrease in HDL cholesterol levels, which may contribute to the increased risk of cardiovascular disease in this population.