Results: During follow-up, 2 patients (1%) died from a non cardiac cause (1 sepsis and 1 chronic obstructive pulmonary disease) and 1 patient (0.5%) experienced non fatal endocarditis. No one suffered from acute coronary syndrome or myocardial infarction and stable angina pectoris did not occur in any patient during this follow-up period.

Conclusions: CTA provides important prognostic informations in patients with normal coronary arteries with excellent long-term prognosis.

IMAGING AND PROGNOSIS IN AORTIC VALVE DISEASE

P4714 | BESIDE
Clinical determinants of incident aortic valve stenosis in patients treated with atorvastatin: results from three large randomized clinical trials
B. Ansenault1, S.M. Boekholdt3, S. Moro2, D.A. Demico4, W. Bao5, J.-C. Tardif6, P. Amarenco7, T.R. Pedersen8, P. Barter9, D. Waters10, 1Montreal Heart Institute, Montreal, Canada; 2Academic Medical Center, University of Amsterdam, Department of Cardiology, Amsterdam, Netherlands; 3Bingham and Women's Hospital, Boston, United States of America; 4Pfizer, New York, United States of America; 5AP-HP - Hospital Bichat-Claude Bernard, Department of Neurology and Stroke Center, Paris, France; 6University of Oslo, Ullevål Univ. Hosp., Center of Clinical Research, Epidemiology & Biostatistics, Oslo, Norway; 7Heart Research Institute, Sydney, Australia; 8San Francisco General Hospital - University of California at San Francisco, San Francisco, United States of America

Background: Aortic valve stenosis (AVS) is the most common valvular heart disease in the Western world, and may share some risk factors with coronary heart disease (CHD). Clinical trials have failed to show a benefit for statin therapy in delaying the progression of AVS among asymptomatic individuals with known AVS. Whether statin therapy may decrease the incidence of AVS in populations enriched with CHD risk factors is unknown. Our objective was to compare the incidence rates of AVS among patients treated with high- versus low-dose statin or placebo to identify clinical risk factors associated with the risk of AVS.

Methods and results: Results from three large-scale atorvastatin trials were included in this study, the Treating to New Targets (TNT) trial, in which 80 mg and mg/day of atorvastatin were compared in patients with stable coronary disease, the Incremental Decrease in End Points Through Aggressive Lipid Lowering (IDEAL) trial, in which atorvastatin 80 mg was compared to simvastatin 20 mg/day in post-myocardial infarction patients, and the Stroke Prevention by Aggressive Reduction in Cholesterol levels (SPARCL) trial, in which 80 mg/day of atorvastatin was compared to placebo in patients with a recent stroke or transient ischemic attack. All patients with known AVS at baseline were excluded from this analysis. During the follow-up (median=4.9 years), 45 patients developed AVS in TNT, 28 in IDEAL and 9 in SPARCL. Among the 82 patients who developed AVS, 39 (47.6%) patients were treated with atorvastatin 80 mg and 34 (41.5%) patients were treated with a lower dose of atorvastatin (5-10mg/day).

Conclusions: Statin therapy did not decrease the incidence of AVS. Our study showed that the risk factors for AVS were similar to those of CHD, but the absolute risk of AVS was lower than that for CHD. Statin therapy may not be as effective in preventing AVS as in preventing CHD.

P4715 | BESIDE
A prospective, double-blinded, randomized trial of Ramipril in asymptomatic aortic stenosis: the RIAS trial
B. Bull1, M. Loudon1, J.M. Francis2, J. Joseph3, T.D. Karamitrus4, B.D. Prendergast2, A.P. Banning3, S. Neubauer4, S.G. Ovrum5, 1Centre for Clinical Magnetic Resonance Research, Department of Cardiovascular Medicine, Oxford, United Kingdom; 2John Radcliffe Hospital, Department of Cardiology, Oxford, United Kingdom

Background: Angiotensin-converting-enzyme (ACE) inhibitors have potential benefit through positive remodeling in aortic stenosis (AS) but no prospective clinical trials have been carried out. We hypothesized that ramipril would lead to positive remodeling of LV mass in patients with AS and potentially slow disease progression.

Methods: We conducted a prospective, randomized, double-blind, placebo-controlled trial focusing on cardiac physiology: 100 patients with moderate or severe asymptomatic AS were randomized to either ramipril 10mg daily (n=50) or placebo (n=50) for a year. Patients underwent assessment at baseline, and twelve months, consisting of CMR scanning to determine LV mass, function, strain, perfusion, and T1 values; echocardiography and exercise testing.
Results: Data was available in 78 patients for the primary endpoint (LV mass) at 12 months. There was a reduction in LV mass in the ramipril group (mean change ± standard deviation: -2.05 ± 1.7g at 6 months; -3.92 ± 2.1g at 12 months, compared to an increase in LV mass in the placebo group: +2.06 ± 1.5g at 6 months; +4.52 ± 2.0g at twelve months (mean difference at 12 months 8.4g [5%]; p=0.006; Figure 1). There was a trend towards reduction in valve area (+0.2m², p=0.067) and increase in peak aortic velocity (+0.1m/sec, p=0.056) in the placebo group, and fewer deaths in the ramipril group after completion of the trial (p=0.074).

Conclusion: Ramipril is safe in moderate and severe asymptomatic AS and leads to a small but significant reduction in LV mass at 12 months. There were trends towards slower progression of valvular stenosis and fewer deaths post-trial in the treatment group. A larger multi-center clinical outcome trial over a longer period is required to determine whether this translates into clinical benefit.

P4719 | BEDSIDE

Echocardiographic evaluation of severe aortic stenosis: impact of three-dimensional imaging and correction for pressure recovery
B.E. Staehler, A. Aboulouf, A. Vecchiat, R. Jenni, F.C. Tanner. Cardiology, Cardiovascular Center, University Hospital Zürich, Zurich, Switzerland

Purpose: In patients with Aortic Stenosis (AS), echocardiographic grading of stenosis severity is important, in particular when valve surgery or Transcatheter Aortic Valve Implantation (TAVI) are considered. Energy Loss Index (ELI) has been proposed to improve the determination of aortic valve area (AVA) by correcting for the effects of pressure recovery. However, the impact of ELI on calculation of AVA in patients with severe AS has not been studied, and the effect of 3D echocardiography in this context is not known.

Methods: Transhoracic (TTE) and Transesophageal (TEE) echocardiography studies of 40 patients (51% males) with severe AS evaluated for TAVI were analyzed. AVA was calculated by the continuity equation based on Left Ventricular Outflow Tract (LVOT) diameter measured in 2D-TTE and 3D-TEE as well as on LVOT area measured on 3D-TTE. In addition, AVA determined by 3D-TEE measurements was corrected for ELI (ELI = [[AVA × Aortic area]/AVA] - Aortic area) and indexed AVA (AVA) obtained from these four methods were compared.

Results: LVOT area was 2.45±0.91 cm² calculated using 2D-TTE diameter measurements, 2.82±0.78 cm² calculated using 2D-TEE diameter measurements, and 4.27±0.89 cm² measured in 3D-TTE (p<0.001). The AVA was 0.52±0.19 cm² calculated using 2D-TTE values, 0.59±0.17 cm² using 2D-TEE values, and 0.36±0.22 cm² using 3D-TEE values (p<0.001). The AVAI calculated by 2D-TEE and 2D-TTE was smaller (0.29±0.11 cm²/m² and 0.33±0.10 cm²/m², respectively) as compared to the value obtained by 3D-TTE (0.51±0.13 cm²/m²; p<0.001). When AVAI assessed by 3D-TTE was considered for pressure recovery by ELI, there was a further increase (0.60±0.17 cm²/m²; p<0.001). Utilizing 3D-TDE and correction for pressure recovery by ELI, 40% of patients were reclassified to have moderate aortic stenosis with an AVAI between 0.60-0.85 cm²/m², and 2 patients had AVAI >0.85 cm²/m².

Conclusions: Since the true LVOT is not circular, the geometric assumptions used for calculation of AVAI from 2D measurements lead to underestimation of AVA in patients with severe AS. The effects of pressure recovery accentuate this problem. When both the true LVOT area and the effects of pressure recovery are considered, AS needs to be reclassified from severe to moderate in over a third of patients. The implementation of these parameters in echocardiographic practice might improve the accuracy of AS severity assessment.

P4720 | BEDSIDE

Current echocardiography guidelines have serious limitations in patients with aortic regurgitation: an echocardiography and cardiovascular magnetic resonance study
S. Gao, C.L. Polte1, K. Lagerström1, U. Cederham1, O. Bøhch-Hansen1.
1 Sahlgrenska University Hospital, Gothenburg, Sweden; 2 Nora Alvborgs Hospital, Trollhattan, Sweden

Purpose: Current echocardiography guidelines on grading of aortic regurgitation (AR) define cut-off levels for six different parameters in favour of severe regurgitation (major criteria). The purpose of the study was to evaluate the feasibility and applicability in clinical practice of these parameters and cut-off levels.

Methods: In this prospective study we performed echocardiography and cardiovascular magnetic resonance imaging (CMR) on the same day in 20 patients with AR prior to aortic valve surgery. The echocardiography parameters included vena contracta width (VC), pressure half time (PHT), effective regurgitant orifice area (EROA), regurgitant volume (RValo), left ventricular diastolic volume index (LVDVI) and end-diastolic flow of velocity reversal in descending aorta (Vedsc). Results: The mean ± SD age was 52±13 years and two were women. Surgery was indicated due to symptomatic AR (90%) or significant left ventricular dilatation (10%). The median (25 to 75% percentile) of RVcmr was 82 ml (60 to 123 ml). All 6 parameters were possible to obtain in only 55% of the patients, whereas ≤3 parameters were obtained in 35% of the patients. There was a significant correlation between number of major criteria and RVcmr (r=0.75, P<0.0001). Thirty-five percent of the patients fulfilled ≥3, whereas 30% fulfilled ≤1 of major criteria. The LVDVI and Vedsc were most feasible and the correlation to RVcmr was strong.

Table 1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Mean ± SD</th>
<th>Range (Min, Max)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LVDVI (ml/m²)</td>
<td>32 ± 20</td>
<td>15 to 70</td>
</tr>
<tr>
<td>Vdsc (cm/s)</td>
<td>20 ± 15</td>
<td>0 to 30</td>
</tr>
<tr>
<td>PHT (ms)</td>
<td>140 ± 90</td>
<td>50 to 300</td>
</tr>
<tr>
<td>VC (cm)</td>
<td>20 ± 10</td>
<td>0 to 30</td>
</tr>
<tr>
<td>RValo (ml)</td>
<td>70 ± 30</td>
<td>0 to 200</td>
</tr>
<tr>
<td>EROA (cm²/m²)</td>
<td>0.5 ± 0.3</td>
<td>0 to 2.0</td>
</tr>
</tbody>
</table>

Correlation with RVcmr (r): 0.80 0.82 0.85 0.45 0.34 0.62

P-value: <0.0001 <0.0001 0.005 0.11 0.31 0.04

10-year survival according to PPM/PLF