Valvular Regurgitation Predicts Cardiovascular Mortality and Morbidity Among American Indians: The Strong Heart Study

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Background: Valvular regurgitation has been extensively examined in cross-sectional studies but there are few data on its association with cardiovascular (CV) morbidity and mortality in population-based samples. Methods: In 3,199 participants (60±8 years, 64% women, 45% hyperensive, 47% diabetes) without prevalent CV disease, stenosis or prosthesis who had echocardiograms in the 2nd Strong Heart Study examination, Cox proportional hazards models were used to estimate hazard ratios (HRs) associated with isolated mitral regurgitation (MR) or aortic regurgitation (AR) or combined MR and AR (MAR) for each outcome. Results: Among participants, 587 (18.3%) had MR of any degree, 198 (6.2%) had any degree of AR and 139 (4.3%) had MAR. During 9,926 person-years of follow-up, 9.0% of participants (N=289) had CV events, 12.4% (N=396) died (28.9% of CV causes and 5.8% died suddenly). In multivariable analyses controlling for age, gender, systolic and diastolic blood pressure, body mass index, glucose, insulin, creatinine, lipid profile, smoking, diabetes and hypertension, MAR but not isolated MR or AR was associated with increased risks of incident CV events (HR 2.0), CV death (HR 2.8), sudden death (HR 5.9) and all-cause death (HR 1.8). For all-cause death, MAR (HR 1.8) was independent of age (HR 1.0). Association of Valvular Regurgitation With Mortality and Mortality

Events

<table>
<thead>
<tr>
<th>Events</th>
<th>MR alone (95% CI)</th>
<th>AR alone (95% CI)</th>
<th>Combined MR and AR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV Events</td>
<td>1.3 (0.9 to 1.8)</td>
<td>1.3 (0.8 to 2.1)</td>
<td>2.0 (1.2 to 3.2)</td>
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<tr>
<td>CV Death</td>
<td>1.4 (0.8 to 2.3)</td>
<td>1.4 (0.7 to 2.8)</td>
<td>2.8 (1.4 to 5.5)</td>
</tr>
<tr>
<td>Sudden Death</td>
<td>2.2 (1.0 to 7.1)</td>
<td>1.2 (0.2 to 6.5)</td>
<td>5.9 (1.4 to 25.6)</td>
</tr>
<tr>
<td>All-cause Death</td>
<td>1.2 (0.9 to 1.6)</td>
<td>1.1 (0.7 to 1.6)</td>
<td>1.8 (1.2 to 2.8)</td>
</tr>
</tbody>
</table>

1030-134 Prevalence and Correlates of Mitral Regurgitation in Hypertensive Patients: The HyperGen Study

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Background: The prevalence and correlates of mitral regurgitation (MR) for hypertensive patients in a population-based sample have not been well described.

Methods: MR was accessed by color Doppler of echocardiograms in 2172 hypertensive and 367 normotensive adults from the population-based Hypertension Genetic Epidemiology (HypGEN) study.

Results: Mild MR was present in 15.3%, moderate in 2.5% and severe in 1.0% of hypertensive participants, versus 15.7%, 8.5% and 0.3% of normotensive adults (p=NS). Among hypertensive patients, MR prevalence was associated with older age. After adjusting for the effect of age, it was also associated with Caucasian ethnicity, larger left atrial size, cardiovascular diseases, systolic blood pressure difference and lower body mass index. The presence and severity of MR was positively associated with increased LV hypertrophy, greater LV diastolic dysfunction and dysjunction. MR prevalence was unrelated to gender difference, diabetes, isolated hypertension and antihypertensive medication.

1030-140 Patent Foramen Ovale: A New Factor Associated With Progression of Carcinoid Heart Disease

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Background: Several studies have demonstrated that serotonin and chemotherapy were associated with the progression of carcinoid heart disease (CHD). The aim of this prospective study was to assess the role of patent foramen ovale in the progression of CHD. Methods: 60 consecutive patients (mean age 58 years, range 40-70, 50% women) with carcinoid syndrome, we performed serial (77) echocardiographic studies. The echocardiographic following parameters were systematically assessed: 1) right-CHD, 2) left-CHD, 3) right to left shunting through a patent foramen ovale (PFO) using contrast echocardiography at rest and after cough test or Valsalva manoeuver.

Results: Mean follow-up was 24 months (range: 12-48 months). At baseline, echocardiography revealed 10 pts (33%) with right-CHD and 4 pts (13%) with left-CHD (Table). At the end of follow-up, the incidence of right-CHD, left-CHD was respectively 53% (16 pts) and 33% (10 pts). The baseline and follow-up frequencies of PFO were respectively 27% (8 pts) and 43% (13 pts). The presence of PFO was strongly associated with the progression of both right- and left-CHD (p=0.001). The metabolite of serotonin (urinary 5-HIAA, p=0.002) and plasmatic chromogranin A (p=0.002) levels were also predictive factors of CHD progression: but not chemotherapy (p=0.7).Conclusion: Our data suggest that PFO is a new important factor of carcinoid heart disease progression and should be systematically researched by serial contrast echocardiographic studies.

1048 Recent Advances in Surgical Therapy for Patients With Valvular Heart Disease

Sunday, March 07, 2004, 3:00 p.m.-5:00 p.m.
Morial Convention Center, Hall G
Presentation Hour: 3:00 p.m.-4:00 p.m.

1048-136 Long-Term Results With the St. Jude Medical Aortic Valve: A 25-Year Experience

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BACKGROUND: From 10/77 – 10/02, 2983 patients (age range 17-94 years, average age 65 ± 13) underwent aortic valve replacement (AVR) with the St. Jude Medical (SJM) valve. Concomitant coronary bypass was performed in 1239 (42%) patients. METHODS: Cardiac Surgical Associates has maintained an independent database of our patients having valve replacement with the SJM prosthesis since the world’s first implant in 10/77. Patients were contacted by questionnaire and/or phone from 11/02 through 6/03. Hospital course and valve-related events were verified by patient chart review and/or physician contact.

RESULTS: Operative mortality was 4% (AVR 3%; AVR/CAB 6%) of which 15 (12%) were valve related. Total follow-up (94%) was 21,742 patient years (range 1 month to 24.8 years, average 7 ± 5 years). At 25 years, overall patient freedom from late mortality was 61% and from late valve-related mortality 93%. Freedom from thromboembolic events was 86%; from bleeding events 81%; from endocarditis 98%; and from valve thrombosis 95%; and from reoperation 91%. Reoperation was carried out in 51 patients (2%) for suture closure of paravalvular leak (n=4), valve replacement (34) and debridement of valve (13). There were no structural failures.

CONCLUSION: The SJM valve has proven to be an effective and durable heart valve prosthesis with a low event rate over the long term.

1048-137 Impact of Valve Prosthesis-Patient Mismatch on Pulmonary Arterial Pressure After Mitral Valve Replacement

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BACKGROUND: Pulmonary arterial (PA) hypertension is a serious complication of mitral valve disease and it is a major risk factor for poor outcome following mitral valve replacement (MVR). We hypothesised that valve prosthesis-patient mismatch (PPM) might be a determinant of PA hypertension after MVR. Methods: Systolic PA pressure was measured by Doppler-echocardiography in 56 patients with normally functioning mitral prosthesis at 24±14 months after MVR. Mitral effective orifice area (MOA) was determined by the continuity equation and indexed for body surface area. Results: Seventy-one (71%) percent of patients had PPM defined as an indexed MOA ≤ 1.2 cm²/m². Thirty patients (54%) had a systolic PA pressure > 40 mmHg and 13 patients (24 %) had a systolic PA pressure > 50 mmHg. There was a good correlation (r=0.64) between systolic PA pressure and indexed MOA (see figure). The average systolic PA pressure and prevalence of PA hypertension (PA pressure > 40 mmHg) were 34±8 mmHg and 19% in
patients with no PPM versus 46±8 mmHg and 68% in patients with PPM (p<0.001). Conclusions: PPM is associated with persisting PA hypertension after MVR. The clinical implications of these results are important given that PPM is frequent in patients undergoing MVR and could largely be avoided by using a prospective strategy at the time of operation.

Accurate of Presurgical Assessment of Myxomatous Mitral Valve Pathology Using Real-Time Three-Dimensional Echocardiography

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Transesophageal echocardiography (TEE) aids in the presurgical planning of mitral valve (MV) disease. However, multiple views are required to delineate the exact location of the MV pathology. Although three-dimensional echocardiography (3DE) provides unique views of the MV, previous methods have been tedious and time consuming. The availability of real-time transthoracic imaging technology overcomes these limitations. Our goal was to evaluate the accuracy of real-time transesophageal 3DE using a newly developed full matrix array probe (x4, Philips) in detecting MV pathology when compared to TEE, using surgical confirmation as the gold standard. Method. 12 patients undergoing TEE evaluation prior to mitral valve surgery were studied. Real-time 3DE images of the MV were obtained from parasternal and apical windows. Images were interpreted by a reader blinded to the results of TEE and surgical diagnoses. Results. 10/12 patients (83%) had adequate 3D image quality for interpretation. 3DE accurately detected abnormal MV segments in 9/10 patients, but failed to detect abnormal A1 and A3 segments of the MV in one patient. TEE failed to correctly diagnose 2 patients. In one patient, a perforated anterior leaflet was misinterpreted. In the second patient, TEE incorrectly interpreted the extent of a P2 lesion. Conclusion. Compared with surgical findings, real-time 3DE has diagnostic ability comparable to that of TEE in detecting abnormal MV segments, but with an important advantage of being less invasive.

Impact of Associated Coronary Disease on Hospital Survival of Patients With Valvular Heart Diseases in New York State (1983-2000)

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Background. Coronary artery disease (CAD) is an important cause of perioperative and late mortality among patients (pts) who undergo surgery (VS) for valvular heart disease (VHD). However, there is no data regarding recent trends in CAD prevalence and its relation to mortality in VHD; also, the benefit of bypass grafting (CABG) plus VS for severe CAD remains. Methods: We conducted a longitudinal analysis (1983-2000) of records from the New York Statewide Planning and Research Cooperative System (SPARCS) inpatient database; each bore a principal or secondary ICD-9 code for CAD=5.8%, CAD/No CABG=8.7%, CAD/CABG=10.3%, p<0.001. MORT in all subgroups decreased similarly over time (p<0.001). Independent MORT predictors in VS+CABG were concomitant CABG=p<0.007), age ≥65 years, female gender, non-white race, CHF, mitral VHD, p<.001 all variables. Conclusions: CAD is frequent in pts with VHD; its prevalence has not decreased over time. In VHD, CAD increases MORT but CABG may not blunt this risk. Additional data must define the basis for this apparent paradox and identify optimal treatment options for this high-risk population.

1067 Emerging Concepts in Regurgitant Valvular Heart Disease

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Background: Experimentally and clinically, chronic aortic regurgitation (AR) causes myocardial fibrosis with hyperproduction of fibroblastic mRNA by cardiac fibroblasts (CF). Using cultured CF, we’ve shown increased activation of c-Jun N-terminal kinase (JNK)-1 of the MAPK cascade in AR, with consistent increases in reaction products. This suggests that the MEKK-MEK-JNK signal module of MAPK could mediate increased FN expression in AR. To test this, we assessed MEK-4 and MEK-7 activity by assaying phosphorylation of JNK-1 protein in NL-CF and AR-CF. Methods: MEK-4 and MEK-7 were immunoprecipitated from lysates of CF cultures (passage 6) from 5 pairs of NL and AR NZW rabbit hearts, then incubated for 30 min in kinase buffer containing γ-ATP with recombinant JNK-1 protein. Samples were separated by SDS-PAGE, dried and autoradiographed. Results: JNK-1 phosphorylation was increased in AR-CF compared to NL-CF (1.7 ± 1.2; p<0.005 for MEK-4 and 1.8 ± 0.7: p<0.001 for MEK-7). Conclusions: Chronic severe AR stimulates JNK-1 activation and increased FN expression by AR-CF. Though confirmation is needed by testing effects of pathway inhibitors, these results suggest possible novel pharmacologic interventions to mitigate fibrosis in AR.