A hitherto study of relationship between left atrial volume and pressure in echocardiogram and length of left atrial branch of left circumflex artery in rheumatic heart disease

No. 833, Muthu Bhavan, Timber Depot Road, Ranichhotam, Nagercoil, Kanyakumari District 629001, India

Background and objective: To study whether there is a relationship between left atrial volume and pressure in echocardiogram and the length of left atrial branch of LCX in coronary angiogram in patients with RHD.

Materials and methods: In our observational study of 52 patients with rheumatic heart disease planned for valve replacement for whom preoperative coronary angiogram was done was observed over a period of 2 years from June 2013 to May 2015. Left atrial indexed volume was calculated by area biplane method and left atrial pressure was estimated by echocardiogram using the formula IVRT/T(E-Ea). Length of atrial branch of LCX was measured in coronary angiography.

Inclusion criteria: (1) age 40–60 years; (2) patients of rheumatic heart disease with moderate to severe lesion planned for valve replacement in sinus rhythm for whom periproCEDural CAG was done. Exclusion criteria: (1) Hypertension; (2) Coronary artery disease; (3) Atrial fibrillation.

Results: Totally 52 patients of rheumatic heart disease were studied of which 31 cases were females (60%) and 21 were males (40%).

Mean age was 50 ± 10 years. The indexed LA volume was highest for mitral stenosis patients with a mean of 67.7, followed by patients with MS/MR of 50.7, and MR patients of 44.7, and then AS/AR of 33.08. The LA pressure/PCWP was categorized as <15 and 31 patients (60%) had PCWP of >15 which maximum number of patients were those with MS/MR followed by those with MS. The Left atrial branch length ranged from 4.0 to 18.3 cm. On further analysis of the length it was found that 73% of MS patients had a length of >15 cm, 52% of patients with MS/MR had a length between 10 and 15 cm, 73% of MR patients had a length between 5 and 10 cm and 80% of AS/AR patients had a length <5 cm.

<table>
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<tr>
<th>RHD patients</th>
<th>Indexed LA volume</th>
<th>Left atrial branch length</th>
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<tbody>
<tr>
<td>MS/MR</td>
<td>50.7</td>
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<tr>
<td>MR</td>
<td>44.7</td>
<td>5–10 cm (73%)</td>
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<tr>
<td>AS/AR</td>
<td>33.0</td>
<td>&lt;5 cm (80%)</td>
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Conclusion: From the above analysis it is found that left atrial indexed volume was highest in patients with MS followed by patients with MS/MR, MR and AS/AR. Also the left atrial branch length seems to be higher in the same order. Thus there seems to be a direct relation between the Left atrial branch size and the left atrial volume. Also there seems to be a relation between left atrial pressure and left atrial branch size which however could not be concluded and needs further studies with catheterization for quantification of left atrial pressure.

3 dimensional echocardiographic evaluation of prosthetic valve dysfunction

R. More*, J. Prajapati, S. Chaudhary, S. Sahoo, A. Shinde, J. Deshmukh
U.N. Mehta Institute of Cardiology and Research Centre, B.J. Medical College Campus, Asarwa, Ahmedabad, Gujarat 380016, India

Background: Echocardiography (Echo) with Doppler is method of choice for noninvasive evaluation of prosthetic valve function. Three-dimensional (3D) imaging and 3D transeophageal echocardiography (TEE) images enabled visualization of valvular anatomy from unique orientations with improved spatial relationships not previously seen with two-dimensional (2D) Echo. In particular, real-time three-dimensional (RT3D) TEE has allowed improved visualization and assessment of prosthetic valves.

Methods: Patient who fulfill the criteria will undergo detailed evaluation of prosthetic valve dysfunction. All patients having prosthetic valve dysfunction with stable hemodynamic are included and 3D Echo findings are compared with 2D Echo.

Results: 10 males (28.6%) and 25 females (71.4%) are evaluated in study. Out of 25 female patients, 2 had bioprosthetic mitral valve. Out of 10 male patients, 1 bioprosthetic mitral valve. Out of 35, 5 patients (3 male and 2 female) had tilting disc mechanical prosthetic valve. 21 Female and 06 Male had bileaflet mechanical prosthetic valve. Motion of leaflets was seen abnormal in 7 (70%) male patients and 21 (84%) female patients by 3D Echo compared to 2D Echo. 3D Echo was shown abnormal motion of leaflets in 6 female and 1 male patient which was not seen on 2D Echo. Abnormal valvular calcification was demonstrated in 7 (70%) male patients and 16 (64%) female patients on 3D Echo. While on 2D Echo only 3 (30%) male and 6 (24%) female patients were found to have abnormal valvular calcification. Valve sewing ring integrity and motion was found abnormal in 2 (20%) male and 2 (8%) female patients on 3D Echo which was not visualized on 2D Echo. Prosthetic valve dehiscence was better seen in 1 (10%) male patient and 4 (16%) female patients by 3D Echo as compared to 2D Echo. On 3D Echo, thrombus was seen in 4 male patients and 11 female patients which was not seen on 2D Echo. On 3D Echo, pannus was seen abnormal in 1 (10%) male patient and 6 (24%) female patients by 3D Echo as compared to 2D Echo. On 3D Echo, vegetations were seen in 2 (8%) female patients by both 2D and 3D Echo. On 3D Echo, any case. Vegetation was seen in 2 (8%) female patients by both 2D and 3D Echo. 3D Echo defined exact site and size of vegetation better than 2D Echo.

Conclusion: In the assessment of prosthetic valves, especially mechanical valves, RT3D imaging allows improved visualization over 2D techniques.
There was statistically significant difference between SVI and LVEF among the three groups. SVI and LVEF were higher in patients with bicuspid group compared to rheumatic and degenerative group which suggest relatively better preserved LV systolic function in bicuspid group.

LV GLS assessment results showed that GLS was decreased in all 3 group. Degenerative and rheumatic group have more decrease in GLS compared to bicuspid group but statistically not significant.

Conclusions:

1. The clinical spectrum of Aortic stenosis is broad. And patients with the same AVA can have different clinical profile, intracardiac hemodynamics and symptoms.

2. Patients with bicuspid aortic valve presents early, mean age 24 years, have less degree of LVH, less systolic and diastolic dysfunction.

3. While patients with rheumatic AS mean age of presentation was 44 years with predominant symptom as dyspnoea. Have significant degree of left ventricular hypertrophy and diastolic dysfunction.

4. Degenerative AS group mean age of presentation was 59 years and most common symptom dyspnoea 72%. Have significantly more left ventricular hypertrophy and diastolic dysfunction compared to other etiologies. They also have more elevated LV filling pressures (E/E') possibly because of higher age of patients and may have preexisting myocardial disease. Ischemic heart disease, diabetes mellitus type 2, systemic hypertension are common in this age group.

5. GLS assessment of patients with preserved LV systolic function LVEF >50%. Showed significant abnormality in GLS suggestive of subclinical myocardial systolic dysfunction. Emphasizes the recommendation for routine use of strain assessment in patients of valvular AS.

**Association of VKORC1 gene polymorphism (1639G>A and 1173C>T) and acenocoumarol maintenance dosage in patients with mechanical heart valve**

S.R. Kalpana*, R. Christopher, G. Bharath, C.N. Manjunath

Sri Jayadeva Institute of Cardiovascular Sciences & Research; NIMHANS, Bengaluru, India

**Background:** Acenocoumarol, an oral vitamin K antagonist, is a commonly prescribed anticoagulant following valve replacement surgery in India and has a narrow therapeutic index. This study aimed at investigating the prevalence of vitamin K 2,3 epoxide reductase C1 (VKORC1) gene polymorphism in south Indian patients and its influence on the inter-individual variability in response to acenocoumarol therapy.

**Methods:** The study cohort included 205 rheumatic heart disease patients with mechanical heart valves, on acenocoumarol therapy with a stable therapeutic INR between 2 and 3.5. VKORC1 1639G>A and 1173C>T genotypes were determined by PCR-RFLP method. Correlation between genotypes and the acenocoumarol dosage was evaluated.

**Results:** The most prevalent genotypes of VKORC1 in our study was wild homozygous GG for-1639G>A and CC for 1173C>T (57.6%). This was followed by heterozygous GA & CT at 36.1% and AA & TT at 6.3%. The Allele frequency for both G and C was 0.76 and for A