MYOCARDIAL VELOCITY IMAGING (DMI) – LV FUNCTION

974
The role of cardiopulmonary exercise testing in the evaluation of cardiac function in a cutlure of lymphomas in adults
L. Eliβ1; J. Vasová1; T. Tomaskova1; F. Jedlicka2; M. Navrátil2; J. Voríček2
1BnH, Czech Republic; 2Faculty Hospital, Internal medicine-hematology Dept., BnH, Czech Republic

Purpose: The authors conducted a study to assess patients of the cardiopulmonary exercise test after a treatment for non-Hodgkin’s and Hodgkin’s diseases and to determine the influence of these parameters on patient’s performance status.

Patients and methods: The authors examined 106 patients (66 male and 40 female) aged 40±15 years 1 year after the treatment. The patients were examined by means of rest and dynamic stress echocardiography and cardiac MRI and echocardiography with TDI were done. In each wall peak systolic and early diastolic strain rates (SR) were measured. In addition, end-diastolic wall-thickness, LV diameter (LVEDD) views longitudinal myocardial function was assessed in the septal and lateral wall. In each wall peak systolic and early diastolic strain rates (SR) were measured. In addition, end-diastolic wall-thickness, LV diameter (LVEDD) views longitudinal myocardial function was assessed in the septal and lateral wall.

Results: The cumulative dose (CD) of doxorubicin (DOX) given was 240±70 (240 mg/m²). 64 patients (60%) experienced the fatigue after the treatment. 3 patients (3%) exhibited clinical signs of heart failure. Apart from 3 patients with rest EF<50%, all the other patients responded to stress echocardiography with an increase of longitudinal myocardial function (LVEF) <40% on standard therapy including ACEI for more than six months were randomized to candesartan 8 mg daily plus spironolactone 25 mg daily (C+S group, N=23) or candesartan 8mg daily alone (C group, N=25) for one year. Cardiac MRI and echocardiography with TDI were done at baseline, 6 and 12 months. Mean systolic and diastolic myocardial velocities of six-LV basal segments were measured by TDI (Sm, Em). Mean strain of six-basal segments, cyclic variation of integrated backscatter (CIVB) and standard deviation of time to peak systolic myocardial velocity of 12 segments (Ts-SD) were assessed.

Results: The 2 groups had comparable demographic data, LVEF by MRI and echo variables at baseline. LVEF by MRI significantly improved in the C+S group compared to C group (D 54±19 vs D 9±5% p=0.01), LV mass by MRI significantly reduced in the C+S group, but increased in the C group (D 11±4% vs D 7±4%, p=0.002) at one year. Meanwhile, the C+S group showed a significant increase in strain (13±1% vs 16±1%, p<0.005), Sm (3.4±0.2 vs 4.0±0.3 cm/s, p<0.05), CIVB (11.2±0.7 vs 13.1±1, p<0.05), and decreased in diastolic filling pressure E/Em (33±5 vs 20±2, p<0.01) from baseline to one year. Ts-SD trended to decrease in C+S group (43±3 vs 37±4 ms, p=0.05). However, there was no change in the C group for strain, Sm, CIVB, E/Em and Ts-SD from baseline to one year follow-up.

Conclusion: Strain by TDI provides useful information in improving LV contractile function and reversing LV remodeling in combination therapy of candesartan and spironolactone with chronic heart failure patients. It probably associates with reduction of myocardial fibrosis verified by CIVB.

LV FUNCTION – OTHER

976
Changes of regional myocardial function and myocardial hypertrophy in patients with severe aortic stenoses during long term follow-up after aortic valve replacement
F. Weidemann1; S. Hermann2; V. Lange1; M. Beer1; M. Niemann2; V. Volker1; G. Erd2; J. M. Strömberg3
1University Hospital, Medical Clinic, Cardiology Dept., Wurzburg, Germany; 2Wuerzburg, Germany

The purpose of this study was to investigate the change in left ventricular (LV) hypertrophy and regional myocardial function in patients with severe aortic valve stenoses at baseline and during follow-up after aortic valve replacement (AVR).

Methods: 17 patients with severe aortic stenoses were studied by conventional echocardiography and strain rate imaging before (baseline), 2 weeks, 9 months and 9 months after AVR. Radial myocardial function was assessed in parasternal long axis views from the posterior wall. By the use of apical four chamber views longitudinal myocardial function was assessed in the septal and lateral wall. In each wall peak systolic and early diastolic strain rates (SR) were measured. In addition, end-diasstolic wall-thickness, LV diameter (LVEDD) and ejection fraction (EF) were extracted.

Results: For radial function a significant increase in systolic SR could be seen already after 2 weeks (baseline = 1.2 ± 0.3 s-1; 2 weeks = 1.7 ± 0.5 s-1, 9 months = 1.7 ± 0.5 s-1). In contrast, systolic longitudinal SR increased only after 9 months significantly (Figure). For diastolic SR no change in the follow-up period could be documented. Parallel to the change of longitudinal systolic SR a significant reduction of LV wall-thickness could be seen only after 9 months (Figure). LVEDD and EF were normal at baseline and remained constant.

977
Echocardiographic evaluation of valvular cardiomyopathy using tissue doppler imaging in chronic severe aortic regurgitation
Y.A. Ivaniv1
1Lvi̇, Ukraine

Background: Postoperative prognosis of patients with severe aortic regurgitation (AR) is favorable if LV contractility is preserved. But in some cases the irreversible changes develop despite of normal preoperative LV EF and lack of symptoms. The aim of this study was to reveal non-stress echo-cardiographic indexes predicting possible postoperative LV dysfunction using TDI technique.

Material and methods: 28 pts (21 men, 7 women, aged 48±5.4) with severe chronic AR and LV EF >55% and LV ESD <55 mm have been examined. 8 pts were in NYHA class I; 12 - class II and 8 - class III. Echo-examinations using TDI study of lateral mitral annulus kinetics for LV longitudinal contractile evaluation was performed in 1-7 days before surgery and 12-18 months after valve replacement.

Results: In late postoperative period the mean LV EDD decreased from 7.1±1.46 cm to 5.4±1.21 cm (p<0.001) and mean LV EF did not change significantly (from 62±3.1% to 59±3.9%). But in 7 pts LV remained dilated with depressed LV EF in 5 of them. In 2 other pts LV became lower than 50% despite of LV size normalization. These 9 pts created the Group A. 19 pts with preserved LV function and LV size and contractility created the group B. All investigated preoperative systolic TDI parameters differed significantly between the groups (Table 1). Also, pts from the group A was older and classified to more advanced functional class. Velocity of systolic movement (V0) correlated with difference of preoperative and latepostoperative LV EDD (r=-0.68) and with final LV EF (r=0.44).

Conclusions: Longitudinal LV contractility indexes obtained by TDI could be reliably used for prediction of postoperative LV dysfunction in pts with severe chronic AR.

Table 1. Preoperative Echo-parameters

<table>
<thead>
<tr>
<th>Age</th>
<th>% of pts</th>
<th>LV EDD</th>
<th>LV EF</th>
<th>Sm</th>
<th>PCTm</th>
<th>CTm</th>
<th>PCTm/CTm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>56±2.4</td>
<td>22</td>
<td>7.3±2.9</td>
<td>60±4.0</td>
<td>8.5±0.2</td>
<td>99±6.0</td>
<td>224±14.8</td>
</tr>
<tr>
<td>Group B</td>
<td>44±1.9</td>
<td>95</td>
<td>7.0±1.7</td>
<td>63±3.5</td>
<td>12.6±0.4</td>
<td>79±4.8</td>
<td>201±3.8</td>
</tr>
</tbody>
</table>

P value | <0.01 | <0.05 | NS | <0.001 | <0.05 | <0.01 | <0.05
Conclusions: These data implicate that in patients after AVR the initial increase in radial function can be due to the reduction of afterload. However, the long-term remodelling after 9 months expressed as a reduction of wall thickness seems to be associated with an increase of longitudinal contractile function.

Quantitative assessment of myocardial contractile reserve during exercise in patients with mitral valve prolapse

P. Lancelotti 1, B. Cosyns 1, G. Van Camp 1, G. Tumminello 1, K. Danai 1, L.A. Pierard 1

1 CHU Sart Tilman, Cardiology Dept., Liege, Belgium; 2 CHIREC, Braine l'Alleud, Belgium; 3 A2 VUB, Brussel, Belgium

Background: Although the actual trends is toward early surgery in patients with asymptomatic severe organic mitral regurgitation (MR), some of them might already have latent left ventricular (LV) dysfunction. This study sought to examine whether tissue Doppler imaging measurement of longitudinal function could be used to identify contractile reserve (CR) during exercise in NYHA II-III patients with MR due to mitral valve prolapse.

Methods: Forty-seven patients underwent quantitative off-line assessment of longitudinal function by averaging peak mitral annular velocities (PSV) obtained at rest and during semi-supine exercise test.

Results: During test, CR defined by ≥4% improvement in ejection fraction was present in 25 patients. As compared to patients with CR, the degree of MR at rest (effective regurgitant orifice (ERO): 43±18 vs 24±14 mm2, p=0.0048) and at peak exercise (ERO 46±22 vs 23±19 mm2, p=0.0049) was greater in the absence of CR whereas ejection fraction was similar (69±6 vs 66±6, p=ns). The increase in PSV (11±1.9 vs 6±2.5 cm/s, p=0.00029) and changes in LV end-systolic volume (±14.7 vs ±4.1±12 ml p=0.0029) during exercise were higher in the CR group. In multivariate analysis, exercise-induced changes in LV end-systolic volume and in PSV independently predicted the presence of CR. An increase in PSV by ≥2 cm/s yielded a sensitivity of 88% and a specificity of 82% to identify positive CR.

Conclusions: Latent LV dysfunction in patients with mitral valve prolapse could be reliably identified using tissue Doppler imaging.

LV FUNCTION – OTHER

Surgical ventricular restoration with mitral valve repair:left ventricular shape and function one year after surgery

J.J. Vaskelyte 1; R. Raugeliene 1; R. Jurkevicius 1; N. Stoskute 1; E. Ereminiene 1; J. Janenaite 1; R. Arzanauskiene 1; J. Marcinkeviciene 1

1 Kaunas University of Medicine, Cardiology Institute, Cardiology Dept., Kaunas, Lithuania

The aim of the study was to compare left ventricular (LV) shape and function changes one year following surgical ventricular restoration (SVR) with mitral valve repair (MVR) in patients (pts) with different localisation of ventricular aneurysm.

Methods: The study group consisted of 72 pts who underwent CABG with SVR and MVR during 2000-2005 yrs: 48 pts underwent LV anterior aneurysm reconstruction (I group), 24 pts - posterior aneurysm reconstruction (II group). The study protocol included evaluation of LV end diastolic and systolic volume indices, LV sphericity, ejection fraction and mitral regurgitation (MR) grade preoperatively, 10-14 days and 1 year after surgery.

Results: Table 1.

Conclusions: SVR with MVR induces improvement in pump function significantly reduction in LV volumes and MR which is sustained during one year. Favorable changes in LV sphericity were associated with LV posterior wall aneurysm reconstruction combined with MVR.

Table 1. Main results

<table>
<thead>
<tr>
<th>age (%)</th>
<th>LV EF</th>
<th>mitral annulus diameter (mm)</th>
<th>MR regurg volume</th>
<th>Longitudinal strain (%)</th>
<th>Radial strain (%)</th>
<th>Longitudinal strain rate (s-1)</th>
<th>mitral valve tenting height (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MR &lt;2/4</td>
<td>n=49</td>
<td>14 -8.2 -6.6 -14 -2.5</td>
<td>-3.3 20.1 -0.37 14.4</td>
<td>0.0048</td>
<td>0.0048</td>
<td>0.0048</td>
<td>0.0048</td>
</tr>
<tr>
<td>MR &gt;2/4</td>
<td>n=52</td>
<td>13 -8.12 -4.6 -13 -3.0 -16.6</td>
<td>-0.18 0.5 -0.5</td>
<td>0.0048</td>
<td>0.0048</td>
<td>0.0048</td>
<td>0.0048</td>
</tr>
</tbody>
</table>

*p<0.05 between pre-op and post-op; #p=0.05 between pre-op and 1 yr. post-op.