Myocardial performance index and flow propagation velocity in left ventricular function assessment in patients with low ejection fraction and different types of diastolic dysfunction

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Purpose: Similar grade of the left ventricular (LV) systolic injury can coexist with different grade of diastolic dysfunction. Patients with restrictive inflow pattern have more severe dysfunction than those with impaired relaxation. Myocardial performance index (MPI) (Ia index), and flow propagation velocity (Prop) are helpful in LV function assessment, but their usefulness in different types of diastolic dysfunction is not well recognized.

Methods: We studied 71 pts with ischemic heart disease or primary dilated cardiomyopathy, with LV ejection fraction (EF) < 45%, on atrial rhythm, and without valvular disease. In 41pts there was impaired LV relaxation (E/A ratio < 0.7, group REL), and in 30 restrictive inflow pattern (E/A ratio > 2.0, group RSI). We assessed LV endoystolic and enddiastolic dimensions, left atrial (LA) dimension, LV EF, velocity of mitral E and A waves and E/A ratio, E wave deceleration time, and Prop. MPI and PropE ratio was calculated.

Results: Mean age, body surface and heart rate in assessed groups were comparable. In REL there were higher dimensions of LV in diastole (6.9±1.1 cm vs 6.4±0.8 cm, p<0.06) and in systole (5.7±1.1 cm vs 5.0±0.7 cm, p<0.01) and (LA) 4.8±0.9cm vs 4.2±0.6cm, p=0.03) than in REL. In REL EF was lower than (REL 28.3±7.2% vs 35.5±8.2%, p<0.001). PropE ratio was higher in REL (2.6±1.0) than in REL (1.6±0.5), p<0.0001. Paradoxically, MPI was higher in REL (0.72±0.2 vs 0.62±0.2, p<0.05) and Prop was higher in REL (36.4±7.5cm, in REL 30.3±9.5cm; p<0.001) in REL we observed significant correlations between Prop and E' (r=0.55), MPI and E' (<0.43). Prop and E/A (r=0.58), and Prop and MPI (r=0.44). In REL there were no significant correlations between estimated parameters.

Conclusion: Myocardial performance index and flow propagation velocity is more useful in global LV function assessment in patients with mild diastolic dysfunction than in those with restrictive inflow pattern. The reason can be more complex mechanism of severe diastolic dysfunction.

Could Tissue Doppler reflect the degree of myocardial dysfunction in patients with dilated cardiomyopathy?


Methods: Long term follow-up of patients undergoing surgical left ventricular patch aneurysmectomy, initially proposed by Jatene and subsequently modified by Dor, is performed with the aim of restoring the morphology of the left ventricular cavity and improving its performance. The

Comparison of global myocardial performance indexes and left ventricular ejection fraction in patients with chronic heart failure

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Background: A new myocardial performance index has recently been developed: the isovolumic/hemodynamic time ratio (IH), that is obtained by relating the sum of the isovolumic time intervals to the sum of the hemodynamic time intervals (ejection time plus filling time). The IH index has been evaluated in patients (pts) with acute myocardial infarction, demonstrating a prognostic value comparable to the Total Ejection Isovolumo (TEI) index, a well validated parameter of systolic-diastolic cardiac performance (Cheetham 2000:124:1645). Aim of the present study is to assess the behaviour of IH, TEI, and left ventricular ejection fraction (LVEF) in a population with chronic heart failure (CHF), and their correlations with symptoms (NYHA class).

Methods: The study population consists of 106 pts with CHF studied consecutively (71 males, 38 females, mean age 71±14). By PW Doppler, 3 time intervals were measured in all pts: interval between two mitral inflow periods, b) ejection time and c) the mitral filling period. TEI index was calculated, as previously described, as [a - b+b]. IH was calculated as [a - b+b].

Results: Mean LVEF was 44±10%, mean TEI index was 0.65±0.32, mean IH index was 0.25±0.12. Linear correlation TEI index vs LVEF was r=-0.49 (p<0.0001). The direct TEI index-H index correlation was highly significant (r=-0.84, p<0.0001). The areas under the ROC curves to identify pts in NYHA class III-IV were respectively 0.79 for LVEF (best cut-off = 41%), 0.72 for IH index (best cut-off = 0.26), 0.69 for TEI index (best cut-off = 0.64).

Table shows the mean values of the 3 indexes in pts with NYHA class I-II and III-IV.

879 Mitral annulus motion predicts EF after aortic valve replacement in the patients with aortic stenosis

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Conclusion: In our series of pts with CHF, LVEF is the parameter more corre- lated to symptoms. Among global myocardial performance measures, the IH index seems to be at least as effective as or even superior to the more known TEI index. Further studies are needed to assess the additional prognostic value of IH index in pts with CHF.

Myocardial performance index and flow propagation velocity is more useful in global LV function assessment in patients with mild diastolic dysfunction than in those with restrictive inflow pattern. The reason can be more complex mechanism of severe diastolic dysfunction.

Table I

<table>
<thead>
<tr>
<th>NYHA class</th>
<th>NYHA class (n=29)</th>
<th>NYHA class (n=30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LVEF</td>
<td>42±10</td>
<td>37±8</td>
</tr>
<tr>
<td>TEI index</td>
<td>0.65±0.33</td>
<td>0.75±0.29</td>
</tr>
<tr>
<td>IH index</td>
<td>0.22±0.10</td>
<td>0.31±0.13</td>
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Conclusions: Our results allow consideration for the predicting value of the amplitude of mitral annulus displacement in the echocardiography population of indices for aortic valve prosthesis indication in adult patients.