THE RIGHT HEART

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The influence of age on right ventricular Tissue Doppler parameters in healthy persons
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Purpose: The aim of this investigation was to determine influence of age on the right ventricular tissue Doppler parameters in normal persons.

Methods: We investigated from 6 to 82 year old, 258 normal persons, 114 female and 144 male. Right ventricular systolic and diastolic velocities at lateral portion of tricuspid annulus were acquired in apical four-chamber view at the junction of the right ventricular free wall and the anterior leaflet of the tricuspid valve, using Doppler Tissue Imaging (TDI).

Results: The mean of maximal velocity (cm/sec) for isometric contraction (S1) was 21.55±5.90, for ejection (S2) -19.46±3.80 for early relaxation (E) -20.99±3.99 and for atrial contraction (A) -18.70±5.59 cm/sec. The difference in TDI parameters between male and female was not significant. The E/A ratio in 27.5% of normal persons was less than 1. The frequency of E/A<1 was greater in older persons and raised with age. In 20-29 year persons it's frequency is 3.39%, in 30-39 years persons - 12.30%, in 40-49 -34%, in older than 50 year persons - 89.19%. It was positive correlation of right ventricular TDI parameters with the same parameters of left ventricular TDI. E/A ratio was in positive correlation with EchCG determined pulmonary artery pressure and in negative correlation with age.

Conclusions: The frequency of E/A<1 on right ventricular TD was greater in older persons and raised with age. This change is more prominent and begins in younger age then the changes of the same parameter on left ventricular TD.

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Comprehensive evaluation of right ventricular function in acute myocardial infarction by tissue Doppler echocardiography. Is Ventricular interdependence exist?
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Background: Ventricular interdependence is present on a moment-to-moment, beat-to-beat basis, and the interactions are large enough to be of physiological and pathophysiological importance.

Aim of the work: We investigated right ventricular function in acute myocardial infarction (AMI) infarction and the effects of left ventricular (LV) infarction on RV function even in absence of RV infarction.

Methods: We selected 157 pts undergoing DSE; group R (n=66, 68 years) had inducible RCA ischemia, group L (n=26, 66 years) had inducible LAD ischemia and group N (n=65, 66 years, matched for risk factor profile) had normal studies. All groups had normal resting RV wall motion. Deformation (end systolic strain - ESS) and strain rate (SR) may be used to quantify function of the RV free wall (RV). We sought to use these parameters to evaluate the RV response to dobutamine stress echocardiography (DSE).

Conclusions: The interaction between the two ventricles can be identified using DTE. In AMI, despite the proved increased risk of morbidity &mortality in RMI, LV dysfunction has more dominant effect. It adversely influence RV function even in absence of RV infarction.

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Subclinical right ventricular dysfunction in patients with right coronary territory ischaemia. Findings of strain rate imaging at dobutamine stress echocardiography
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Introduction: Right ventricular dysfunction (RVD) is difficult to evaluate in pts with inducible right coronary territory ischemia. Tissue Doppler-derived strain (ESS) and strain rate (SR) may be used to quantify function of the RV free wall (RV). We sought to use these parameters to evaluate the RV response to dobutamine stress echocardiography (DSE).

Methods: We selected 157 pts undergoing DSE; group R (n=66, 68 years) had inducible RCA ischemia, group L (n=26, 66 years) had inducible LAD ischemia and group N (n=65, 66 years, matched for risk factor profile) had normal studies. All groups had normal resting RV wall motion. Deformation (end systolic strain - ESS, peak SR, time to peak SR) and velocity (peak systolic velocity) were measured at rest and peak stress in the basal segments of the RV and LV (interventricular septum). Comparisons of means between groups and between rest and peak stress were made with Mann-Whitney U test.

Results: Resting peak SR for the RV was similar between groups R (1.33±0.5), L (-1.57±0.5) and controls (-1.47±0.4). At rest, the RV SR was unrelated to the presence of scar identified by wall motion analysis. At peak stress (Table 1), group R had lower RV peak SR compared to controls (p=0.037). In contrast, peak SR in group L was not different to controls. Peak stress tissue systolic velocity was similar across all groups. Time to peak SR and ESS were similar between group R and L.

Conclusion: Assessment of myocardial deformation may identify inducible subclinical RV dysfunction.

Table 1. Peak stress parameters

<table>
<thead>
<tr>
<th>Group</th>
<th>RV FW (mean±SD)</th>
<th>Group L</th>
<th>Group R</th>
<th>p value *</th>
</tr>
</thead>
<tbody>
<tr>
<td>N (n=66)</td>
<td>Group N</td>
<td>Group L (n=26)</td>
<td>Group R (n=66)</td>
<td></td>
</tr>
<tr>
<td>Peak SR</td>
<td>-2.37±0.59</td>
<td>-2.07±0.85</td>
<td>-2.03±0.6</td>
<td>p&lt;0.037</td>
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<td>(1/sec)</td>
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<tr>
<td>End Systolic Strain (%)</td>
<td>-26.4±7.7</td>
<td>-24.3±11</td>
<td>-20.5±7.8</td>
<td>p=0.320</td>
</tr>
</tbody>
</table>

*Mann-Whitney U Test