Longitudinal myocardial functions are affected by chronic smoking in young healthy people: a study of color tissue Doppler imaging

O. Gulci, K. Soyli, M. Yarici, S. Demircan, K. Durma, M. Sahin. 19 Mayyis University, Cardiology, Samsun, Turkey

Many cardiac and hemodynamic alterations occur after acute consumption of cigarette.

Aim: To evaluate the effect of chronic smoking on longitudinal myocardial functions of left ventricle in young, healthy people by using color 2-dimensional tissue Doppler imaging modality.

Methods: Ninety-nine healthy participants were studied. There were 65 smokers and 34 non-smokers. All subjects were between 20 and 35 years old. For color 2-dimensional tissue Doppler imaging, apical 2- and 4-chamber views were acquired. Sample volumes were placed on the mid left ventricle in the inner half of the myocardium at the septum, lateral, inferior, and anterior walls. The peak systolic strain (S-S), peak systolic strain rate (S-SSR), peak early diastolic strain (E-SS), peak early diastolic strain rate (E-SSR), peak systolic tissue velocity (S-TV), early diastolic tissue strain (E-TV) and early diastolic tissue strain rate (E-SSR) were measured. Three consecutive beats were measured and averaged for each measurement. To simplify the analysis, the values at each wall were combined and averaged to obtain mean values.

Results: For the systolic parameters S-S, S-SSR and S-TV values were not different between the groups. For the diastolic parameters smokers had lower E-SS, E-SSR and E-TV than the sensors (p=0.038 and p=0.037, respectively). Although there was a trend toward higher A-SSR and A-TV values in the smokers, they were not reaching the statistical significance (Table 1).

Table 1

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
</tr>
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<tbody>
<tr>
<td>S (%), E (%), S-SSR, E-SSR (mm/sec)</td>
<td>0.032</td>
</tr>
<tr>
<td>A-SSR, E-SSR (mm/sec)</td>
<td>0.044</td>
</tr>
<tr>
<td>S-TV (mm/sec)</td>
<td>0.470</td>
</tr>
<tr>
<td>E-TV (mm/sec)</td>
<td>0.032</td>
</tr>
<tr>
<td>A-TV (mm/sec)</td>
<td>0.588</td>
</tr>
</tbody>
</table>

Conclusion: Chronic smoking in young, healthy people causes significant alterations in some of the longitudinal myocardial function parameters as assessed by color 2-dimensional tissue Doppler imaging.

Myocardial Doppler parameters add incremental benefit over clinical and standard echo predictors in predicting outcome in chronic kidney disease

D. Rahit, N. M. Isbel, T. H. Marwick. 1 University of Queensland, Department of Medicine, Brisbane, Australia; 2PA Hospital, Renal Unit, Brisbane, Australia; 3University of Queensland, Brisbane, Australia

Background: Myocardial injury in pts with chronic kidney disease (CKD) is multifactorial, involving hypertensive and coronary heart disease and metabolic disturbances including calcium homeostasis. We hypothesized that myocardial tissue velocities could add incremental benefit to existing clinical and echo predictors of outcomes.

Methods: Clinical data, resting 2D echo parameters and dobutamine echo parameters (BDE) were obtained in 155 pts with CKD (mean age 59yrs, 87 male, and 58% are black). LV volume was calculated from the parasternal long axis, and minor and major axes in the 4 chamber view. LV mass was calculated using ASE guidelines and indexed for height^2/7. Mitral inflow velocities, E/A ratio and deceleration time (DT) were recorded. Colour tissue Doppler images (TDI) were used to measure myocardial velocity during systole (Sm), early filling (Em), and late filling (Am). Ischaemia was defined as a new or worsening wall motion abnormality between rest and stress images.

Results: There were 24 deaths over 1.7yrs. Clinical predictors of events were: phosphate (1.84±0.5 mmol/l), HbA1c (6.1, p=0.002) and albumin (38.0±4.5 g/l); HR 0.9, p=0.05. Echo predictors were septal thickness (1.4±0.9 cm, HR 4.7, p=0.003 and diastolic dysfunction (n=16, HR 4.3, p=0.05) but not LV mass, E/A ratio or LV mass index. Average Sm (5.5±1.9 cm/s, HR 0.6, p=0.002) and Sm (5.4±2.3 cm/s, HR 0.7, p=0.003) were also predictive of outcome. In a sequential Cox regression models (Table), addition of both BDE and TD parameters added incremental value to clinical predictors of outcome.

Model | Predictors of Mortality | Chi Square |
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<tbody>
<tr>
<td>Clinical + Echo + TDI</td>
<td>33.1, p&lt;0.001</td>
<td>Lp</td>
</tr>
<tr>
<td>TDI</td>
<td>8.5, p=0.04</td>
<td>Lp</td>
</tr>
<tr>
<td>Clinical + Echo + TDE</td>
<td>37.1, p&lt;0.001</td>
<td>Lp</td>
</tr>
<tr>
<td>Clinical + Echo + TDI + TDE</td>
<td>47.2, p&lt;0.001</td>
<td>Lp</td>
</tr>
</tbody>
</table>

Conclusion: Myocardial characteristics can predict mortality in pts with CKD. Tissue velocities provide incremental value above both clinical data and standard echo measurements.

Myocardial Doppler imaging in overt hypertrophic cardiomyopathy: a tissue Doppler echocardiographic study

S. K. Tariyakeguri, H. Ozkcn, M. C. Baez, S. Okoye, O. Tariyakeguri, T. Bozli. 1Bursa Yuksek Ihtisas Hospital, Cardiology Department, Bursa, Turkey; 2Bursa Yuksek Ihtisas Hospital, Cardiovascular Department, Bursa, Turkey

Aim: The aim of this study was to assess left ventricular myocardial regional function in overt hypertrophic cardiomyopathy by using tissue Doppler imaging in relation to the hormonal profile and standard hypertrophic echocardiographic examination.

Methods: We studied 50 patients in this study and divided them into two groups. Group 1 consisted of 25 patients (21 women, 4 men) with newly diagnosed, untreated overt hypertrophic cardiomyopathy and compared with Group 2 which consisted 25 (21 women, 4 men) healthy individuals. Baseline demographic characteristics were homogeneous.

Results: In standard echocardiographic examination, left ventricular internal diameters, ejection fraction and endocardial fractional shortening were similar between the two groups. At standard echocardiography, patients with overt hypertrophic cardiomyopathy had significantly longer aortic contractile time (RVC) (63.1±13.9 vs 70.21±11.25, p<0.05), diastolic time (DT) (165.6±24.1 vs 167.2±23.5, p=0.014) and isovolumic relaxation time (IVRT) (90±14.6 vs 77.7±1.41, p=0.022) and a lower E/A ratio. Pulsed TD imaging measurements from septum and lateral mitral annulus showed lower myocardial systolic velocity (Sm) (0.07±0.019 vs 0.08±0.048, p=0.016), longer precontraction time (PCT) (80.6±18.0 vs 68.27±6.02, p=0.001) and relaxation time (RT) (97.6±14.04, 70.2±12.41, p=0.037) in Group 1.

In tissue Doppler imaging the mean values from septum, lateral, inferior and anterior walls were calculated at the basal, mid and apical LV segments. In Group 1, mean peak systolic strain (S) (16.47±1.45 vs 20.36±1.51, p=0.001), mean Sm (1.9±0.13 vs 1.47±0.11, p=0.001), mean SmS (1.7±0.05 vs 2.30±0.25, p=0.01) and mean SmSs (2.2±0.31 vs 1.46±0.32, p=0.025) showed significantly lower.

In the overall population strain and strain rate parameters were correlated negatively with thyroid stimulating hormone and positively with FT3 and FT4. Conclusion: These results confirm that overt hypertrophic cardiomyopathy is associated with early global impairment in LV longitudinal myocardial functions. TDI is superior to conventional echocardiographic in detecting pre-clinical myocardial abnormalities. As a result, TDI is useful in grading the disease and detecting early impairment of left ventricular systolic functions.

Left ventricular longitudinal myocardial function in overt hypertrophic cardiomyopathy: a tissue Doppler echocardiographic study

S. K. Tariyakeguri, H. Oziken, M. C. Baez, S. Okoye, O. Tariyakeguri, T. Bozal. 1Bursa Yuksek Ihtisas Hospital, Cardiology Department, Bursa, Turkey; 2Bursa Yuksek Ihtisas Hospital, Cardiovascular Department, Bursa, Turkey

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Levels of S98 Abstracts

Methods: 42 H1 (22 males and 20 females of mean ages 56.36±13.59 years) with no echocardiographic disorders and with normal echocardiographic ejection fraction of LV (>55%) were compared to 25 normal individuals (NI) of the same age and sex. AH was identified as blood pressure >140/90 mmHg based on the WHO criteria. All patients were measured, several readings on each of 2 or more office visits. SF of LV and RV was evaluated in the apical 4-chamber view by measuring: a) the mitral (MAPSE) and the tricuspid (TAPSE) annulus plane systolic excursion respectively (cm) from the M-mode echocardiography alter alignment of the M-mode line with the mitral or tricuspid annulus, and b) the peak systolic velocity (cm/sec) of mitral (SMA) and tricuspid (STA) annulus respectively by TDI. Data were expressed as "mean ± standard deviation", statistical analysis was performed by the student's t-test method and by the Chi^2 method and p<0.05 was considered statistically significant.

Results: TDI disclosed significantly different values of S98 and S9A between H1 and NI. 90% (80% vs 98%) were significantly higher in H1 compared to NI. Moreover, significantly higher percentage of H1 compared to NI showed abnormal values of S98 (< 15cm/sec) and S9A (< 11cm/sec). 50% versus 24% (< p=0.05) and 26% versus 4% (<p=0.01) respectively. However, no different percentage was recorded regarding abnormal S9A (≥15cm/sec) and TAPSE (<15cm/m/sec) in H1 and NI. 9.5% versus 8% (<p=0.05) and 5% versus 4% (<p=0.05) respectively. Conclusively, the noninvasive detection of systolic ventricular dysfunction appears to be feasible at hypertension individuals only by tissue Doppler imaging, observation which could contribute to the wider clinical application of this echocardiographic modality in the future.