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## Left ventricle myocardial performance index by tissue Doppler in healthy adults

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**Background & Aim:** The Myocardial Performance Index (MPI) by Tissue Doppler (TD) is a reliable and reproducible parameter to identify left ventricle function. There is a significant correlation between the MPI values by standard Pulse Wave (PW) Doppler and TD modalities in normal left ventricle function. It is unknown if this correlation is maintained throughout a wide range of age in healthy population. The aim was to identify the normal reference range for MPI by TD in healthy individuals across a wide range of age.

**Method:** MPI by TD and PW Doppler were obtained via trans-thoracic ECHO. The LV MPI via PW was calculated from the mitral valve inflow in apical four and the aortic valve out flow in apical three chamber windows. MPI calculated using the formula  $MVCO-AV ET/AVET$ . The LV MPI by TD was calculated by the standard TD in apical four-chamber view at the mitral annulus level of the anterolateral and inferoseptal walls, calculated using the formula  $IVRT+IVCT/ET$ . Two readers confirmed the inter-observer variability.

**Result:** The MPI was measured in 99 cases with normal left ventricle function and no prior cardiac event. Of these, 50 individuals were male and 49 were female. The mean LVEF was 61.5%. The means of systolic and diastolic diameters were 3.1 mm and 4.7 mm respectively. Mean LV mass 146 cm<sup>2</sup>. The enrolled cases were further divided by age into four groups. Group-I: 17-44 years, Group-II: 45-60 years, Group-III: 61-75 years and Group-IV: >75 years. The mean LVEF and LV dimensions were similar among these groups. The LV MPI was obtained at a mean heart rate 76 bpm. The time required performing measurements in each view. Mean MPI for all the healthy cases by PW 0.5 and TD septal/lateral 0.384/0.386. The LV MPI for each group range by PW for male were [G-I 0.52, G-II 0.59, G-III 0.49, G-IV 0.48]. The LV MPI for each age group by PW for female were [G-I 0.49, G-II 0.54, G-III 0.45, G-IV 0.47]. The LV MPI for each age group by TD septal and lateral for male were [G-I 0.36/0.3, G-II 0.35/0.36, G-III 0.46/0.39, G-IV 0.35/0.36]. The LV MPI for each age group by TD septal and lateral for female were [G-I 0.37/0.36, G-II 0.37/0.42, G-III 0.41/0.42, G-IV 0.33/0.45]. The Pearson correlation between the TD septal MPI and TD lateral MPI= 0.337 with p value=0.001 The Pearson correlation between the PW MPI and TD septal MPI= 0.18 with p value=0.078. The Pearson correlation between the PW MPI and TD lateral MPI= 0.13 with p value=0.217.

**Conclusion:** This study is a comprehensive assessment for TDI-MPI across a wide age range in males and females. The septal and lateral LV TD MPI are well correlated for all the groups in both genders. However, in age group 61-75years there is an increase in the reference value for the normal MPI by TDI. The RV MPI by PWD showed significant variation when divided by gender especially in the in-age group 61-75years. This variation is not seen by TDI for the RV MPI. This may be of value in clinical application.

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