The application of Tissue Doppler image-derived Tei index for assessment of regional function
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Background and Objectives: Tei index has been reported as a useful predictor of global ventricular function in patients with congestive heart failure. However, the application of this index for the assessment of regional function has not been reported. We therefore investigated whether the tissue Doppler image (TDI)-derived Tei index can reflect left ventricular (LV) regional function. Materials and Methods: We prospectively studied 17 patients (mean age 62 ± 9 yrs, 5 women; group 1) with LV regional wall motion abnormalities and 17 healthy persons (mean age 43 ± 8 yrs, 9 women; group 2) having a normal left ventricular relaxation. The Tei index, defined as the sum of isovolumetric contraction time and isovolumetric relaxation time divided by ejection time, was measured in basal and mid segments of LV walls from standard apical views (4, 2, and 5-chamber view). We also obtained the velocity data of TDI in each segment. LV wall motion was classified into normal, hypokinesia, and akinesia based on visual analysis. Results: The mean LV ejection fraction of all patients was 41 ± 8% in group 1 and 63 ± 7% in group 2. The TDI-Tei index, peak systolic velocity (Sm), early diastolic velocity (Em), and late diastolic velocity (Am) were analysed in total 407 segments (203 in group 1, 204 in group 2). In group 1, the TDI-Tei index in dysfunctional segments (akinesia or hypokinesis, n=63) were significantly higher than those of normal segments (n=140), 0.714 ± 0.169 vs 0.668 ± 0.135, p=0.023, respectively. The value of TDI-Tei index, Sm, Em, and Am were 0.742 ± 0.201, 4.173 ± 1.339, 5.311 ± 1.879, and 5.568 ± 2.360 in akinetic, 0.677 ± 0.101, 4.962 ± 1.565, 5.357 ± 2.072, and 5.219 ± 2.366 in hypokinetic, and 0.668 ± 0.135, 5.422 ± 1.526, 6.119 ± 2.372, and 6.806 ± 2.428 in normal segments. The TDI-Tei index and Sm in group 2 were significantly different those in group 1, 0.489 ± 0.081 and 7.408 ± 1.775 vs 0.683 ± 0.147 and 5.131 ± 1.564, p<0.001 and p<0.001, respectively. A significant correlation was also present between TDI-Tei index and Sm (r=-0.302, p<0.001). Conclusion: We demonstrated that the Tei index can reflect regional dysfunction.