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Title: TDI velocities of tricuspid annulus in patients with acute pulmonary embolism

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Body: The aim of this study was to determine whether the velocities from tissue Doppler imaging (TDI) of the tricuspid annulus (TA) could be used as helpful markers of right ventricular (RV) function comparing healthy controls and patients with pulmonary embolism (PE). Materials and methods: Echocardiography (EchoCG) and pulsed TDI were performed in 167 patients with acute PE and normal left ventricular ejection fraction, and in 35 matched healthy volunteers (CG). The tricuspid annulus systolic (S tr_v) and diastolic velocities (E and A tr_v) were acquired in apical four-chamber view using TDI. Results: EchoCG with continuous and pulse wave Doppler in patients with acute PE showed: 1. RV dilatation $x = 33.4 \pm \text{SD } 3.6$ mm, in 75% of patients; 2. Pulmonary hypertension: systolic pulmonary artery pressure (PAPs) $x = 43.7 \pm \text{SD } 7.6$ mmHg and mean pulmonary arterial pressure (PAPm) calculated using Debestani formula $x = 33.2 \pm \text{SD } 3.5$ mmHg. In patients with PE systolic and diastolic TA velocities were significant lower than in healthy controls: S tr_vPTE = $11.1 \pm \text{SD } 1.7$ cm/s and S tr_vCG = $16.9 \pm \text{SD } 1.9$ cm/s ($p < 0.001$); E tr_vPTE = $11.4 \pm \text{SD } 1.9$ cm/s and S tr_vCG = $16.9 \pm \text{SD } 2.0$ cm/s ($p < 0.001$). There was a good reverse correlation between S tr_v and PAPs ($r = 0.73$, $p < 0.001$), and PAPm ($r = 0.75$, $p < 0.001$). In patients with PE right atrium (RA) and inferior vena cava (IVC) dilatation S tr_v was significant lower $10.8 \pm \text{SD } 1.5$ cm/s than in patients with normal RA and IVC dimensions $11.8 \pm \text{SD } 1.8$ cm/s ($p < 0.05$). Conclusion: In clinical settings EchoCG and TDI of TA in patients with PTE are valuable noninvasive methods for evaluation of PAPm, PAPs, RV dimensions and RV function.