

Right ventricular function in patients with pulmonary hypertension; the value of myocardial performance index measured by tissue Doppler imaging

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Abstract

Aims

Myocardial performance index (MPI) measured by conventional Doppler is routinely used to assess right ventricular (RV) systolic function in patients with pulmonary hypertension (PH). Our aim was to determine whether MPI measured by Doppler tissue imaging (tMPI) is effective in assessing RV function in these patients.

Methods and results

Retrospectively, we have studied 196 patients with chronic PH [pulmonary arterial systolic pressure (PASP) 81 ± 40 mmHg] and 37 healthy volunteers (PASP of 27 ± 7 mmHg). According to the exclusion criteria, 172 patients were included in the final study cohort. All patients were evaluated for RV systolic function by different parameters. MPI was measured by both conventional and tissue Doppler imaging. Bland–Altman analysis showed moderate agreement between MPI and tMPI (the mean difference was -0.02 , absolute difference = -0.32 to 0.29 ; 95% intervals of agreement, percentage of average = -46.6 to 40.8%). In 50 consecutive PH patients where additional parameters were calculated, we found a significant correlation between tMPI and RV ejection fraction ($r = -0.73$, $P < 0.0001$) and RV fractional area change ($r = -0.58$, $P < 0.0001$). No significant inter- and intra-observer variability was identified.

Conclusion

This study demonstrated a moderate agreement between two methods of measuring MPI. A good correlation of tMPI with RV ejection fraction and RV fractional area change was found indicating that tMPI might be superior to MPI Doppler. tMPI is a parameter unaffected by RV geometry and importantly has the advantage of simultaneously recording the time intervals from the same cardiac cycle.

Keywords

Pulmonary hypertension, Myocardial performance index, Doppler tissue imaging, Right ventricle