Mid-Term Follow-Up of Left Ventricular Remodeling and Optimal Coronary Microcirculation of The Infarct-Related Artery Following Primary Percutaneous Coronary Intervention: A Comparative Cross-Sectional Study

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Aims:

The purpose of this study was to evaluate the use of simple angiographic parameters such as coronary sinus filling time (CSFT) and myocardial blush grading (MBG) in combination with a simple non-invasive speckle tracking echo (STE) for assessment of the early LV functional recovery post-PPCI of the final TIMI grade in the infract related artery.

Methods:

This study included 142 patients who presented to our cardiac catheterization unit with acute STEMI for PPCI and were divided into two groups based on MBG: Group I (113 patients) included patients with TIMI III flow and optimal MBG of 3 after PPCI, and Group II (29 patients) included patients with TIMI III flow and non-optimal MBG of 2 after PPCI. The simple angiographic parameters TIMI flow, MBG, and estimation of CSFT were used to assess optimal coronary reperfusion post-PPCI. The CSFT is computed as follows: CSFT in seconds = (last frame count−first frame count/15). And assessments of LV function by 2DE [LV end-systolic volume index (LVESVI) and volume-derived LVEF (Vol-LVEF)] with STE analyses before and early within 24 hours after PPCI for both groups, with six-month follow-up.

Results:

We discovered that CSFT after the PPCI cutoff of 3.7335 seconds accurately "predicted early LV functional recovery following PPCI". Lastly, CSFT demonstrated a statistically significant moderate correlation (r = -0.643) with LV- GLS, and an LV-GLS cutoff of -16.6 percent accurately "predicted early LV functional recovery following PPCI." LVESVI of 40 to 45 mL/m^2 increase the risk of death. The LVESVI threshold of 45 mL/m^2 that was used in the past was a strong indicator of a higher risk of death.

Conclusions:

TIMI flow, myocardial blush grade, and a novel CSFT, LVESVI and LV-GLS are used as simple predictors of optimal coronary microcirculation and early LV functional recovery post PPCI in acute STEMI.

Keywords:

Myocardial blush grade; coronary microcirculation; coronary sinus filling time; speckle tracking; primary percutaneous intervention; remodeling