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micro rna expression profiling may predict cardiac remodeling after stemi

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Background: MicroRNAs have been recognised as important modulators of cardiovascular function. However, their profiling in ischemic heart disease and contribution to cardiac remodeling has not been defined.

Methods: We examined 40 patients with STEMI and 20 healthy controls. MicroRNA expression profiling was carried out within 48 hours of the index ischemic event, measuring the expression of microRNA-144,-150,-499 (cardioprotective action), -21, and -208 (remodeling stimuli). In addition, every patient was evaluated by echocardiography, which was repeated after a 2-year follow-up period.

Results: Left-ventricular end-systolic volume (LVESV) and left-ventricular end-diastolic volume (LVEDV) decreased (from 57.7± 6.3 to 48.6± 5.2, $p < 0.05$ and from 102.1± 7.1 to 85.9 ± 5.7, $p < 0.05$, respectively) while the ratio of early mitral inflow velocity to mitral annular early diastolic velocity (E/e') did not change (from 9.32± 0.6 to 9.56± 0.8, p= NS). Mir-208 and -499 expression within 48 hours of STEMI (1.91± 0.43/U6sn and 1.7± 0.48/U6sn respectively) were significantly positively correlated with a reduction in LVESV, LVEDV, and E/e'. In specific, mir-208 expression was associated with an absolute (r= -0.41, $p < 0.05$) and a percent reduction (r=-0.45, p= 0.03) in LVEDV and an absolute reduction in E/E' (r= 0.46, $p < 0.05$), while mir-499 was associated with an absolute (r= -0.4, $p < 0.05$) and percent reduction (p= -0.38, $p < 0.05$) in LVESV. Mir-499 median value (1.78[1.292.01]) predicted reverse remodelling (LVESV reduction by >15%) with satisfactory specificity (0.82).

Conclusion: Mir- 208 and -499 expression may contribute to cardiac remodeling after STEMI, while mir-499 could be used as a prognostic marker of reverse remodeling.