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MicroRNA-208b gene expression levels as a biomarkers of left ventricular dysfunction in patients with acute myocarditis

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Purpose: MicroRNAs (miRs) play a major role in protein regulation by post-transcriptional gene expression and cell to cell interaction. Recently, they have been emerged as important modulators in cardiovascular development and disease. Our aim was to determine whether cardiac related miRs such as miR-208b was differentially expressed in peripheral blood mononuclear cells from patients with acute myocarditis. We also evaluated their expression levels in peripheral blood mononuclear cells in relation with left ventricular global longitudinal peak strain (GLPS) in those patients.
Methods: We assessed the expression levels of miR-208b in 45 patients with acute myocarditis (38 men, mean age 31±10 years) and 22 healthy individuals (18 men, mean age 33±9 years). Blood samples were taken on admission and miR expression levels in peripheral blood mononuclear cells were quantified by real-time reverse transcription polymerase chain reaction. All patients were also underwent an assessment with standard conventional transthoracic and a two-dimensional speckle tracking echocardiography.
Results: GLPS was significantly reduced in the group of myocarditis compared to healthy individuals (from −13.7 ± −7.9% versus −22.2±6.7%, $p<0.05$). Myocarditis patients showed significantly higher miR-208b (28.5±6.6 versus 6.40±1.1, $p<0.001$) expression levels compared to control group. miR-208b gene expression levels at baseline revealed a significant negative correlation with GLPS on admission ($r=-0.51$, $p<0.05$). This correlation was independent of the patients' clinical parameters.
Conclusions: Our data reveal that miR-208b gene expression levels are upregulated in peripheral blood mononuclear cells from patients with acute myocarditis relative to healthy individuals. In addition, miR-208b levels have a prognostic value in the deterioration of left ventricular GLPS in those patients. Thus, miR-208b may represent a promising biomarkers in myocarditis or a potential therapeutic target in the future.