Circulation of miR-26a, miR-191, and miR-208b in plasma of patients with acute myocardial infarction

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Madam, cardiovascular disease is a disease involving the heart and blood vessels.[1] Coronary artery disease has one of the highest morbidity and mortality rates. The well-known types of acute coronary syndromes include ST-elevation myocardial infarction (STEMI) and non-ST-elevation myocardial infarction (NSTEMI).[2] A delay in treatment would increase the mortality rate, therefore a biomarker which could point towards the presence of acute myocardial infarction (MI) would save countless lives. Micro ribonucleic acids (miRNAs) are a class of endogenous, single-stranded, 19-22 nucleotide, non-coding RNAs.[3] Presently, they have been identified as a potential diagnostic biomarker for acute MI.

A study[3] was conducted investigating the relationship between miRNAs and acute MI. This clinical trial examined 174 people; 87 suffered from acute MI and the 87 were normal healthy individuals who acted as a control group. There were 32 patients with NSTEMI and 55 with STEMI. Fasting venous blood samples were collected. The first sample was collected from patients suffering from acute MI immediately after admission within 4 hours of onset of symptoms, and further samples were noted at daily intervals for three days. miRNA microarray chip analysis and quantitative real time polymerase chain reaction (qRT-PCR) were used to detect and quantify the levels of miR-26a, miR-191 and miR-208b in the acute MI and non-acute MI samples. Acute MI patients had lower systolic and diastolic blood pressures and higher white blood cell count and troponin T levels. miR-208b was considerably increased in patients suffering from acute MI while miR-26a and miR-191 were decreased. A receiver operating characteristic (ROC) curve analysis was carried out to determine the instructive power of the miRNAs for MI. miR-208b was higher in NSTEMI compared to STEMI, while the other two markers showed no significant difference. Lastly, a dual-luciferase reporter assay was carried out, which indicated p21 as a direct target of miR-208b. Previous studies have shown the use of these miRNAs to diagnose cardiac failure, hypertension and acute MI diagnosis and prognosis.[4]

The plasma levels of miRNAs have important prognostic values and may affect mortality of acute MI patients.[5] Till now cardiac troponins and creatinine kinase-myocardial band (CK-MB) are the most common biomarkers for MI. Moreover, their availability is limited. Therefore, further research studies need to be conducted with a much larger sample size, measurements taken at more frequent intervals and with improved methods of detecting miRNAs in order to obtain accurate results and establish efficiency of this technique.

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