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SERIAL CHANGES OF PLASMA MIR-320 LEVEL IN PATIENTS WITH ACUTE ST ELEVATED MYOCARDIAL INFARCTION DURING THE PROCESS OF REPERFUSION AND ITS RELATIONSHIP WITH ISCHAEMIC REPERFUSION INJURY

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Objective To evaluate the serial changes of plasma microRNA-320 (miR-320) level in patients with acute ST elevated myocardial infarction (STEMI) in the course of ischaemic reperfusion (I/R), explore the relation between the changes of miR-320 and I/R injury. Furthermore, to provide some evidence of miR-320 as a potential biomarker of I/R.

Methods Thirty patients with STEMI (25 males) undergoing primary percutaneous coronary intervention (PCI) were involved. Their blood flow was TIMI 0/1 flow grade before reperfusion and TIMI 2/3 flow grade after reperfusion. The ST-segment elevation did not reduce spontaneously before reperfusion, but a resolution of at least 50% of the most prominent ST-segment elevation was observed 2 h after reperfusion. Control group (n=20, 15 males) with normal coronary angiography was set up. Venous blood samples were obtained before reperfusion, immediately after reperfusion (0 h), and 2 h, 4 h, 6 h, 6–12 h, 12–24 h, 24–72 h after successful reperfusion. Plasma miR-320, Hsp-20 and MDA levels were tested and their changes during reperfusion were analysed. The relationship between the changes of miR-320 and I/R injury was also evaluated.

Results There were almost no significant differences in baseline clinical and laboratory characteristics between STEMI group and control group. The smokers, WBC and BNP in STEMI group were significantly higher than control group ($p<0.01$). MiR-320 levels of patients were significantly higher than control group ($p<0.001$). There was a changed in the plasma miR-320 levels during the process of reperfusion, it rose to the peak value in 2 h post reperfusion, and then decreased gradually to the level of reoperation about 12 h after reperfusion. The value of 0 h (19.43 ± 3.22), 2 h (22.07 ± 4.54), 4 h (14.89 ± 2.85) was significantly elevated compared with before reperfusion (8.13 ± 1.40) ($p<0.05$). All Hsp-20 levels of patients were significantly higher than controls ($p<0.01$) except 24–48 h point. Hsp-20 value changed during the reperfusion course, and 2 h (1.113 ± 0.245 ng/ml) was distinctly higher than reoperation (0.528 ± 0.176 ng/ml) ($p<0.01$). But it decreased obviously at 4 h after reperfusion (0.675 ± 0.211 ng/ml) and fell to the level of before reperfusion at 6 h. Compared with controls, MDA of patients were increased ($p<0.05$). It also changed in the process of reperfusion, and reached the peak value at 2 h. Bivariate analysis was carried out between plasma miR-320 peak levels and Hsp-20 peak levels, MDA peak concentration, CK, CKMB, TnT peak values and LVEF in all patients. Plasma miR-320 levels were positively correlated with plasma Hsp-20 levels ($r=0.479$, $p=0.016$). MiR-320 levels were negatively correlated with CK values ($r=0.441$, $p=0.031$), and partly negatively correlated with CKMB and TnT values ($r=0.348$, $p=0.104$, $r=0.294$, $p=0.288$). There was no correlation between miR-320 and MDA, LVEF. Multiple liner regression analysis didn't find any independent predictor of plasma miR-320 levels.

Conclusion Plasma miR-320 levels of STEMI patients definitely changed during the process of reperfusion. It rose to the peak value 2 h post reperfusion, and then decreased gradually to the level of preoperation about 12 h after reperfusion. Plasma miR-320 levels were significantly positively correlated with its target protein-Hsp-20 levels, but significantly negatively correlated with CK values.