

Acute myocardial infarction is one of the leading causes of mortality and morbidity worldwide. On the basis of literature it was defined as myocardial cell death due to prolonged ischemia. In the last two decades the progressive developments in the field of mechanical (percutaneous coronary intervention) and pharmacological therapies have contributed to reduce myocardial damage and subsequent remodeling. Several studies published in last years, have revealed the diagnostic value of circulating microRNAs for acute myocardial infarction detection. MicroRNAs are a class of single stranded and non coding RNAs which are involved in some cardiac disorders such as myocardial infarction, cardiomyocyte hypertrophy and, also, in heart failure. However, the diagnostic capacity of miRNAs for acute myocardial infarction is still controversial; some studies demonstrated that microRNAs are involved in regulating cardiac cell death and regeneration after myocardial infarction. Infact a growing number of studies showed the role of microRNAs in regulating apoptosis, necroptosis and autophagy in cardiomyocytes. Some microRNAs such as miR-17, miR-18a, miR-19a, miR-19b has been demonstrated to be associated with cardiomyocytes proliferation; miR-548-3p, miR-509 3p have been demonstrated to be involved in regulation of cell cycle progression. These are only some correlations recently demonstrated. Furthermore an interesting alternative to compensate the cardiomyocytes loss during acute myocardial infarction it could be to stimulate proliferation and differentiation of cardiac stem cells or their progenitors. Some studies *in vitro* showed that overexpression of miR - 1 family enhances cardiac differentiation of cardiac progenitor cells. On the basis of the data we can find in the literature, microRNAs have a great potential to offer a novel potential diagnostic biomarkers in the setting of acute coronary disease and acute myocardial infarction. We expect more large scale, multicenter clinical studies and trials to validate the known data of specificity and sensitivity of microRNAs. This volume reported and summarize some recent review and studies about microRNAs and acute myocardial infarction and I hope it can answer the doubts.



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