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ABSTRACT BOOK



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Dysregulation of Circulating microRNAs in Young Acute Myocardial Infarction Patients in Kuantan, Pahang

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ABSTRACT

Introduction: Acute myocardial infarction (AMI) among young adults (YAMI) is an emerging concern, often presenting with distinct clinical and molecular characteristics compared to mature AMI (MAMI) patients. Circulating microRNAs (miRNAs) have gained attention as minimally invasive cardiovascular biomarkers. However, data describing miRNA dysregulation among young AMI patients remain limited. This study aimed to identify and validate differentially expressed circulating miRNAs between YAMI and MAMI patients in Kuantan, Pahang. **Materials and methods:** A case-control study was conducted involving 20 YAMI and 20 MAMI patients presenting to Hospital Tengku Ampuan Afzan, Kuantan, and 20 healthy controls recruited from Klinik Kesihatan Bandar Kuantan. Initial miRNA profiling identified a set of dysregulated candidates. The top six miRNAs were subsequently validated using quantitative real-time PCR. Fold-change expression and statistical significance were analysed using the comparative Ct method. **Results:** Of the six miRNAs assessed, three showed significant differential expression between groups. miR-423-5p was upregulated in YAMI patients (2.08-fold, $p = 0.040$), whereas miR-431-5p and miR-378a-5p were markedly downregulated, by 33.90-fold ($p = 0.034$) and 34.61-fold ($p = 0.040$), respectively. These findings reflect a distinct circulating miRNA expression profile in younger individuals with AMI. **Conclusion:** The dysregulation of miR-423-5p, miR-431-5p, and miR-378a-5p highlights potential molecular differences underlying AMI in younger patients. These miRNAs represent promising candidates for biomarker development in early diagnosis and risk stratification. Further studies with larger cohorts and functional validation are warranted.

Keywords: Biomarker; cardiovascular disease; mature acute myocardial infarction (MAMI); microRNA (miRNA); young acute myocardial infarction (YAMI)