

Preoperative Plasma MicroRNA -126 Predicts Postoperative Hyperglycemia

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Background

MicroRNA (miR) 126 is a plasma-stable, short non-coding RNA, which is highly expressed in endothelial cells. Prior reports have shown inverse correlation between the circulating level of miR-126 and severity of diabetes mellitus. Moreover, it was found that miR-126 down regulation antedated the manifestation of the disease. The aim of this study was to investigate whether preoperative plasma miR-126 determination predicts postoperative dysglycemia and adverse outcomes in patients undergoing cardiac surgery.

Methods and Results

Seventy-one patients undergoing open-heart surgery were enrolled prospectively. Preoperative plasma miR-126 expression level was determined by quantitative reverse transcription–polymerase chain reaction (qRT-PCR) and normalized to cel-miR-39.

Of the 71 patients evaluated, 26 (36.6%) were previously diagnosed as diabetics, and 56 (78.9%) had hemoglobin A1c (A1C) > 5.7%. The plasma levels of miR-126 were significantly higher in patients with A1C > 5.7% than in patients with A1C ≤ 5.7% (p<0.05). In addition, a significant linear correlation was observed between preoperative plasma miR-126 expression and postoperative hyperglycemia as reflected by insulin infusion rate in the first 36 hours postoperatively (according to our insulin infusion ICU protocol to control hyperglycemia; p<0.05).

Dysregulation of preoperative miR-126 expression levels did not correlate with postoperative complications, including: severe infections, neurological impairment, renal failure, cardiac adverse events, prolonged intubation, multiple organ failure, and death (p>0.05).

Conclusions

Mir-126 dysregulation relates to both preoperative glycemic control and postoperative hyperglycemia. However, it may not predict the risk of postoperative cardiac surgery complications. Interestingly, mir-126 levels were found to be upregulated. This may be due to other cardiac surgical patient's factors that could have influenced our results.