Plasma Micro-RNA 21 In Patients with Type 2 Diabetes Mellitus and Its Correlation with Albuminuria and Cardiometabolic Risk

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ABSTRACT

Background:

Diabetic kidney disease (DKD) and peripheral vascular disease (PVD) are two major complications that are frequently encountered in T2DM patients. The purpose of this study was to examine the potential ability of miRNA-21 as a biomarker for detecting new cases of T2DM as well as identifying those with T2DM and DKD or PVD.

Methods:

In this unique case-control study, 90 subjects were enrolled in the study and classified into 3 main groups: group (1): 30 T2DM patients with normoalbuminuria (urinary albumin creatinine ratio [uACR] <30mg/gm), group (2): 30 T2DM patients with evidence of albuminuria (uACR >30 mg/gm), and lastly group (3): 30 healthy volunteers as a control group. Patients were collected from the DM and metabolism outpatient clinic at Alexandria Faculty of Medicine. Real-Time Quantitative Reverse Transcription Polymerase Chain Reaction (qRT-PCR) was used to evaluate plasma microRNA-21 expression levels.

Results:

Plsama microRNA-21 levels were considerably higher in T2DKD patients compared to those with normal uACR. In addition, in T2DM patients, plasma microRNA-21 demonstrated a positive correlation with uACR. The ROC curve analysis for microRNA-21 profiling in T2DM patients also revealed that microRNA-21 had a quite acceptable diagnostic performance (AUC= 0.800) for identifying DKD in T2DM patients. Likewise, microRNA-21 was positively correlated with PVD as represented by measurements of the ankle-brachial pressure index (ABPI). Moreover, microRNA-21 proved to be a reliable clinical indicator for assessing severity of PVD in patients with T2DM with an AUC of 0.841.

Conclusion:

Plasma microRNA-21 was found to be a signature microRNA that can be used to pick up new cases of T2DM as well as identifying those with T2DM and evidence for either DKD or PVD.

Key words:

type 2 diabetes mellitus, diabetic kidney disease, albuminuria, peripheral vascular disease, microRNA-21