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Angiotensin II receptor blocker (ARB) alters microRNA profile of circulating exosome in patients with diabetic nephropathy

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Objectives: Renin-angiotensin system (RAS) is a major target of diabetes. Angiotensin II receptor blockers (ARB) decrease the mortality and morbidity of patients with diabetes. Extracellular vesicles (EVs) contain miRNAs regulate biologic process. This study attempted to identify the exosomal miNRA profile change in patients with diabetic nephropathy after ARB treatment.

Methods: We prospectively enrolled age-sex matched healthy volunteers (HV) ARB naïve 6 patients (male=4, female=2) with diabetic nephropathy. After collection baseline sample, ARB (losartan 50 mg) was added to patients. Serum exosomal micro RNAs were profiled by RNA sequencing baseline and 3 months after ARB treatment.

Results: RNA sequencing identified 156 miRNAs in exosome from HV and patients. ARB decreased the expression of 6 miRNAs in exosome from patients. Three miRNAs expression was increased after ARB treatment. Biological analysis identified the predicted involved pathways of these miRNAs (table 1).

Conclusions: Our study demonstrates ARB affect the expression of miRNAs in circulating exosome from patients with diabetes. Therefore, miRNAs change in exosome by ARB is a novel aspect of RAS. Further study needs to identify the role of these miRNAs in diabetes.

Table 1. The predictive pathways of ARB reponsvie miRNAs

Table 1. predictive pathway of angiotensin receptor blocker responsive miRNAs

Pathway	Num of genes	P-value
Pathways in cancer	66	0.0000162
Ribosome biogenesis in eukaryotes	20	0.0000849
Prostate cancer	25	0.00037
Cell cycle	31	0.000414
Chronic myeloid leukemia	22	0.000414
RNA transport	31	0.000419
Small cell lung cancer	23	0.000419
HTLV-I infection	42	0.000703
Pancreatic cancer	20	0.000951
Focal adhesion	40	0.0031