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Bariatric surgery alters urinary exosomal small RNA profile in diabetic obese patients

Dughyun Choi[1], Hyungnae Kim[2], Jin Seok Jeon[2], Hyunjin Noh[2], Dong Cheol Han[2], Yun-Ui Bae[3], Soon Hyo Kwon[2]
[1]Department of Internal Medicine-Endocrine, Soonchunhyang University College of Medicine, Korea, Republic of
[2]Department of Internal Medicine-Nephrology, Soonchunhyang University College of Medicine, Korea, Republic of
[3]Department of Internal Medicine-Endocrine, Keimyung University School of Medicine, Korea, Republic of

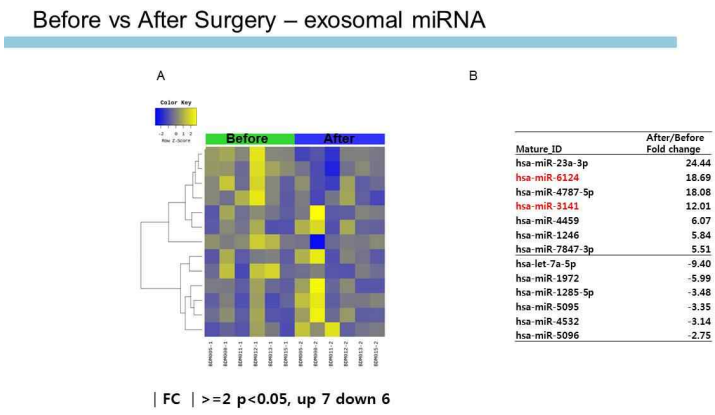
Objectives: Exosomal small RNAs are known to play a role in gene expression in many tissues. The aim of this study was to compare the urinary exosomal small RNA profiles of obese type 2 diabetic (T2DM) patients compared with those of healthy volunteers (HVs). Furthermore, the study aimed to determine whether bariatric surgery reverses the changes to the urinary small RNA profiles of obese T2DM patients.

Methods: We recruited age-sex matched HVs and obese T2DM patients (n=6 each). Urinary exosomal small RNA profiles were analyzed using RNA sequencing. To evaluated the effect of bariatric surgery, we also assessed urianry exosomal small RNA profiles in obese T2DM patients 6 months after surgery.

Results: The exosomes of obese T2DM patients had higher proportions of tRNA and lower proportions of miRNA than those of HVs (59.3% vs 38.1%, 15.7% vs 41.8%, respectively). After bariatric surgery the gap between 2 groups was reduced (tRNA – 43.4% and miRNA – 34.9%). Bariatric surgery altered the expression of 13 miRNAs (upregulation= 7, downregulation=6 , respectively) (fig 1).

Conclusions: The obese T2DM patients a distinct urinary exosomal small RNA profile compared to HVs. Weight loss after bariatric surgery alters the urinary small RNA profiles in obese T2DM patients.

Figure 1. The expression change of urinary exosomal micro RNAs after bariatric surgery



Mature_ID	After/Before Fold change
hsa-miR-23a-3p	24.44
hsa-miR-6124	18.69
hsa-miR-4787-5p	18.08
hsa-miR-3141	12.01
hsa-miR-4459	6.07
hsa-miR-1246	5.84
hsa-miR-7847-3p	5.51
hsa-let-7a-5p	-9.40
hsa-miR-1972	-5.99
hsa-miR-1285-5p	-3.48
hsa-miR-5095	-3.35
hsa-miR-4532	-3.14
hsa-miR-5096	-2.75