Effect of Qizhu Tangshen Granules on spontaneous type 2 diabetic nephropathy in KKAY mice

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Background: The aim of the animal study was to observe the therapeutic effect of Qizhu Tangshen (QT) granules a Traditional Chinese Medicine formula on spontaneous type 2 diabetic nephropathy in KKAY mice.

Method: Twelve male C57BL/6J mice were fed with normal diet as control animals. Sixty-three male KKAY mice were fed with high-fat diet as experimental animals. The experimental groups were as follows: control group, model group, QT Granule dose group (7.15g/kg, 14.3g/kg, 28.6g/kg), pioglitazone group (10mg/kg), valsartan capsule group (10mg/kg). The mice were administered continuously for 10 weeks, then the urinary protein at 8 weeks, renal function at the end of experiment, blood glucose, glycosylated hemoglobin and blood lipids were detected. The HE, Masson staining and changes of renal pathological structure under electron microscope were also observed.

Results: Compared with control group, the concentration of urinary protein and serum creatinine (CRE) increased significantly ($P<0.05\sim0.01$), and blood glucose remained at a high level ($P<0.01$) in model group of KKAY mice. The levels of serum total cholesterol (TCH) and triglyceride (TG) were significantly increased ($P<0.01$) and the area of kidney tissue was increased about 10% ($P<0.01$). Obvious glomerular pathological changes were observed under light microscope and electron microscope. Compared with the model group, the levels of urinary protein, serum CRE and blood glucose were all significantly decreased in high, middle and low doses of QT groups ($P<0.05\sim0.01$). In the group of low-dose QT group, the level of HBA1c and TG were significantly decreased ($P<0.05\sim0.01$). In addition, QT granules can reduce the structural lesion of renal tissue, and the area of renal fibrosis was reduced by about 5~6% ($P<0.05\sim0.01$) in high and middle dose group.

Conclusion: QT Granules can significantly reduce concentration of urinary protein, improve renal function, inhibit renal fibrosis, reduce renal tissue lesions and regulate glycolipid metabolism. QT granules show a significant therapeutic effect on spontaneous type 2 diabetic nephropathy of KKAY mice.