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Protective effects of Vit D/VDR on renal autophagy in early stage of 12-weeks diabetic mice induced by STZ

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Background: Autophagy is an important cause of diabetic nephropathy (DN). We found that the expression of nuclear transcription factor VDR in renal tubule epithelium was down-regulated and negatively correlated with urinary albumin and inflammation in DN patients, while intestinal disease and tumor related studies suggested that vitamin D receptor (VDR) could regulate autophagy. Therefore, we studied the relationship between Vit D/VDR and renal autophagy in early stage of 12 weeks diabetic mice induced by STZ.

Methods: In order to investigate the potential regulation of VDR on autophagy in renal cells, we established streptozotocin (STZ) induced diabetic nephropathy model on VDR knockout mice and wild type mice. Then we used VDR agonist paricalcitol to interfere with wild-type mice induced by STZ. The autophagy related indexes, such as LC3II/I, ATG16L1, P62, inflammation and fibrosis level were measured at 12 weeks in the renal cortex of mice.

Results: Results of immunohistochemistry and western blot showed that the level of LC3II/I, ATG16L1, FN and collage were clearly lower in renal tissue of non-diabetic VDR knockout rats than those of the wild type. Level of those indexes also lower in STZ induced diabetic VDR knockout mice than in wild-type mice. Expression of P62 in diabetic VDR knockout mice induced by STZ was significantly higher than that in wild-type DN mice and VDR knockout mice. Paricalcitol could up-regulate LC3II/I protein and ATG16L1mRNA and inhibit the accumulation of P62 protein in wild-type DN mice, but did not inhibit the expression of P62 mRNA.

Conclusion: VDR is involved in the regulation of autophagy in early stage of diabetic nephropathy. Paricalcitol may play a protective role in renal autophagy activation in early stage of diabetic mice induced by STZ through up-regulating ATG16L1 and promoting the degradation of P62.

Recent Publications

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Biography

Jishi Liu is working as an associate professor in Third Xiangya Hospital of Central South University in Changsha City, China. Her main research area is in prevention and treatment of acute and chronic kidney disease, the clinical and basic research of IgA nephrology. She received three funding support. Headed over 1 NSFC of China, 2 Hunan provincial natural science fund subject, and published 24 SCI papers.

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