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스트렙토조토신 유발 당뇨병성 신증 흰쥐에서 녹차추출물의 보호 효과

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Protective Effects of Green Tea Extracts on Streptozotocin-induced Diabetic Nephropathy in Mice

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Background: Diabetic nephropathy is one of the most serious complications in diabetes mellitus and has been the most common cause of end-stage renal disease. Green tea extracts (GTE) have antioxidant properties and is responsible for the renoprotection. Osteopontin (OPN) is a large phosphoglycoprotein adhesion molecule, and has emerged as a potentially key pathophysiologic contributor in diabetic nephropathy. We examined whether GTE could ameliorate the development of diabetic nephropathy and its role of OPN.

Methods: The mice (n=40) were divided into 4 groups. Control group (n=10) was intraperitoneal (IP) injected 0.9% saline, Streptozotocin (STZ) group (n=10) was IP injected STZ 200 mg/Kg and induced diabetic nephropathy. GTE group (n=10) was received 0.1% GTE by oral rout from 4 weeks to 16 weeks. STZ plus GTE group (n=10) was received with same dose. Serum glucose, blood urea nitrogen, serum creatinine, urine volume and urine protein amounts were measured at 16 weeks. Western blot assay of OPN was compared for the different groups. Histopathologic examination and immunohistochemical staining of mice kidney were performed.

Results: Compared with control group, STZ-group showed an increase in blood glucose, blood urea nitrogen, creatinine levels and urine protein amounts, and a decrease in body weight. All the above parameters were significantly reversed with GTE treatment. After STZ injection, there were a diabetic glomerulosclerosis with increased renal OPN accumulation and its protein expression in the kidney cortex. GTE-treated mice kidney showed a reduced expression of above parameters and an reserved pathologic findings.

Conclusions: These results suggest that GTE ameliorates STZ-induced diabetic nephropathy by OPN suppression. The potential use of GTE in the treatment of diabetic nephropathy should be further explored.

Key Words: 녹차추출물, 당뇨병성 신증, 오스테오폰틴
Green tea extracts, Diabetic nephropathy, Osteopontin