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당뇨병성 신증에서 벤포티아민의 항염증 효과

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Inhibitory Effect of the Benfotiamine on Hyperglycemia-induced Inflammatory and Fibrogenic Signals in DM Nephropathy

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Background: Benfotiamine is an anti-oxidant and anti-inflammatory substance. We aimed at verifying the protective effect of benfotiamine against the development and progression of diabetic nephropathy in an in-vivo and in-vitro model.

Methods: Diabetic rats were prepared by injecting streptozotocin (STZ, 65 mg/kg). Those that developed diabetes after 72 h were treated with benfotiamine (70mg/kg). Diabetic rats without benfotiamine treatment and nondiabetic rats were used for control. Rat mesangial cells were treated in high glucose (HG, 50 mM) and normal glucose (NG, 5 mM) conditions.

Results: Benfotiamine-treated diabetic rats exhibited decreased albuminuria, and NADPH-dependent ROS generation. Immunohistochemistry showed reduced type IV collagen and fibronectin deposition in the glomeruli compared with nontreated diabetic rat. Parallel changes were shown in the tissue mRNA and protein expression level of MCP-1, TGF-β1,fibronectin and type IV collagen in the kidney. These findings suggest that benfotiamine protects against kidney injury via transketolase upregulation.

Conclusions: Benfotiamine exhibited a renoprotective effect in the progression of experimental diabetic nephropathy. Future research is warranted to investigate the protective mechanism of benfotiamine more specifically and to help set the basis for clinical use of this substance in the prevention of diabetic nephropathy.

Key Words: 당뇨병성 신증, 벤포티아민, 항산화제
Diabetic nephropathy, Benfotiamine, Antioxidant