당뇨병성 신증에서 근위세뇨관 상피세포의 자멸사 및 비타민 C의 억제효과

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Purpose : Oxidative stress has been suggested to play a role as a common mediator of apoptosis and kidney damage in diabetes. However, it is uncertainwhether the apoptosis occurs in the kidney during the course of diabetes. We investigated the occurrence of apoptosis in the diabetic rat kidney, the role of oxidative stress and the effect of an antioxidant on apoptosis in the diabetic rat kidney.

Methods : Male Otsuka-Long-Evans-Tokushima-Fatty rats, an animal model for type 2 diabetes, were randomized into a non-treated diabetic group (n=8) and a vitamin C-treated group (n=8). Long-Evans Tokushima Otsuka rats (n=8) were used as a control. Intra-nuclear DNA fragmentation, in formalin-fixed kidney tissues, was labeled in situ using an apoptosis detection kit.

Results : Apoptosis was present in the epithelial cells of the proximal tubules in diabetic rats. However, apoptotic cells were not identified in the diabetic rat glomeruli. The number of apoptotic cells was significantly decreased in vitamin C-treated diabetic rats when compared to the untreated diabetic rats. Vitamin C treatment also significantly suppressed renal malondialdehyde, proteinuria, albuminuria, mesangial expansion or sclerosis, and tubulointerstitial sclerosis in diabetic rats without significantly affecting plasma glucose.

Conclusion : Vitamin C suppresses the progression of diabetic nephropathy, and this may be due to the reduction of apoptosis in renal proximal tubular epithelial cells.