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Protective effects of antioxidants on high Glucose-induced malfunctions in human glomerular mesangial cells

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Abstract:

Altered functions of mesangial cells induced by high glucose concentrations are thought to play an important role in the pathogenesis of diabetic nephropathy. We therefore investigated the effect of high glucose (39.2 mM) alone and in combination with taurine (500 μ M) or vitamin E (100 μ M) in serum free medium (RPMI 1640) on the proliferative growth response and turnover of type IV collagen by human glomerular mesangial cells (GMC). The results showed that the high glucose level decreases the proliferation of the GMC which is reversed by taurine and vitamin E. In order to control the osmotic effects of high glucose, the GMC were also cultured in the presence of manitol. Manitol had no effect on the proliferation of GMC. Furthermore, the results showed that addition of vitamin E or taurine to media containing high glucose could reverse and normalize the collagen turn-over by the cultured mesangial cells. These results suggest that taurine and vitamin E may function as endogenous agents in the kidney to limit the development of glomerulosclerosis in diabetic renal disease.

Keywords:

Mesangial cells . High glucose and extracellular matrix

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