(구두-3)

고려홍삼의 항 당뇨 및 합병증 억제 효능연구

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When considering that adipose tissue is a one of the major organs affected in the pathogenesis of chronic metabolic syndrome excess of adipose tissue increases risk of type II diabetes and its complications. In addition to this, vascular hypertrophy, a characteristic feature of human and experimental diabetes, has been complicated in the pathogenesis of the vascular complications of this diseases. The role of mast cells as a potential source of growth factors that may contribute to this hypertrophic process has been postulated. The pharmacological actions of the korean red ginseng extracts, ginsenosides Rb_1, Rc, and Re, and the ginseng metabolites (protopanaxadiol and protopanaxatriol) were investigated in terms of the differentiation of mouse 3T3-L1 preadipocyte and the apoptosis of HMC-1 human mast cell to assess their usefulness in treating the diabetes and its vascular complications. The extent of adipocyte differentiation was measured by Oil red O staining method and expression of transcription factor C/EBPα. Apoptotic effect of protopanaxadiol was assessed by MTT assay and FACS analysis and its mechanism of action was investigated in terms of MAPK signaling cascade. Korean red ginseng extract at 200 and 300 ug/ml seems to induce preadipocyte proliferation with time. However, Korean red ginseng extracts, ginsenosides, protopanaxadiol, and protopanaxatriol do not cause any significant effects on the adipocyte differentiation as compared with MDI (M; 0.5mM, 3-isobutyl-1-methylxanthine, D; 1 uM, dexamethasone), I; 10 ug/ml, insulin) treated control. On the contrary, 1 uM pioglitazone, a thiazolidinediones antidiabetic agent induced significant differentiation of the adipocyte that has been known as a primary target of thiazolidinediones. This was confirmed by measuring the expression of transcription factor C/EBPα and leptin gene expression. Moreover, the korean red ginseng (200 ug/ml) extract and protopanaxatriol(1uM) did not alter the effect of pioglitazone-induced adipocyte differentiation. Propanaxadiol(PPD) causes HMC-1 cell apoptosis in a concentration- and time-dependent manner. PPD at 25 uM reduced HMC-1 cell viability up to about 60% of control upon measuring at 5 hours after treatment. This apoptotic effect seems to be correlated with the increased JNK phosphorylation and decreased ERK phosphorylation in MPAK signaling cascade. Taken together, this results allows us to proposes that the korean red ginseng extracts may be used to ameliorate the pathogenesis of the vascular complications of diabetes without causing adipocyte differentiation.

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