Disease-modifying effects of glucosamine HCl involving regulation of metalloproteinases and chemokinesactivated by interleukin-1B in human primary synovial fibroblasts

何秀娥
Lu HT;Liang YC;Sheu MT;Ho HO;Lin YT;Hsieh MS;Chen CH

Abstract

The purpose of this study was to investigate the possible involvement of synovium in cartilage destruction in osteoarthritis (OA) patients. Using human primary synovial fibroblasts (HPSFs), we examined the effects of glucosamine (GLN) on the regulation of the expression of matrix metalloproteinases (MMP-1, -2, and -13) and chemokines (IL-8, MCP-1, and RANTES) as well as the involvement of MAPK signal pathways (JNK, ERK, and p-38) and the transcription factor of NF-kappaB on the present or absence of interleukin (IL)-1beta. Our experiments showed that protein production and mRNA expressions of MMP-1, MMP-3, MMP-13, IL-8, MCP-1, and RANTES were downregulated by treatment with glucosamine in HPSFs. The results further showed that GLN could inhibit IkappaBalpha phosphorylation and IkappaBalpha degradation leading to inhibition of the translocation of NF-kappaB to nuclei. However, GLN upregulated MAPKs pathways in HPSFs cells with or without IL-1beta. The results suggest that the inhibition of MMP-1, -3, and -13 expressions as well as IL-8, MCP-1, and RANTES productions by GLN might mediate suppression of NF-kappaB signal pathways, and HPSFs seem to have a potential functions as an alternative source of MMPs and chemokines for inducing the degradation of cartilage in OA.