Glucosamine Inhibits IL-1ß-Induced NFκB Activation in Human Osteoarthritic Chondrocytes

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OBJECTIVE

Glucosamine sulfate (GS) is a commonly used drug for the treatment of osteoarthritis. The mechanism of the action of this drug does, however, remain to be elucidated. In human osteoarthritic chondrocytes (HOC) stimulated with a proinflammatory cytokine, we studied whether GS could modify the NFκB activity and the expression of COX-2, a NFκB-dependent gene.

METHODS

Using HOC in culture stimulated with interleukin-1 ß (IL-1ß), the effects of GS on NFκB activation, nuclear translocation of NFκB/Rel family members, COX-1 and COX-2 expressions and syntheses and prostaglandin E2 (PGE2) concentration were studied.

RESULTS

GS significantly inhibited NFκB activity in a dose-dependent manner, as well as the nuclear translocation of p50 and p65 proteins. Furthermore, GS-preincubated IL-1ß-stimulated HOC showed an increase in IκBα in the cell cytoplasm in comparison with HOC incubated with IL-1ß alone. GS also inhibited the gene expression and the protein synthesis of COX-2 induced by IL-1ß, while no effect on COX-1 synthesis was seen. GS also inhibited the release of PGE2 to conditioned media of HOC stimulated with IL-1ß.

CONCLUSIONS

GS inhibits the synthesis of proinflammatory mediators in HOC stimulated with IL-1ß through a NFκB-dependent mechanism. Our study further supports the role of GS as a symptom- and structure-modifying drug in the treatment of OA.

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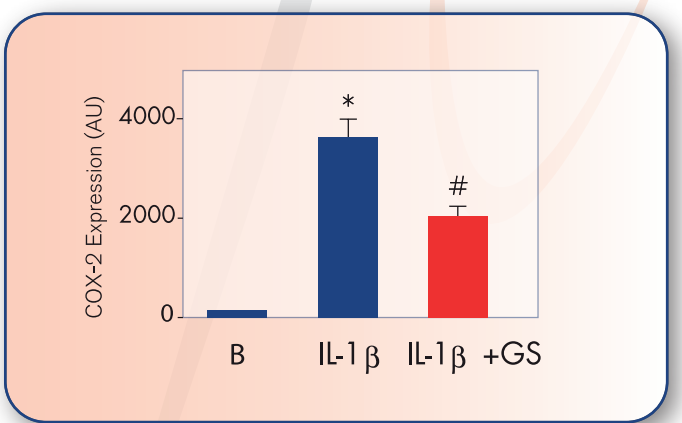

Effects of GS on COX-2 mRNA expression.
Densitometric analysis corresponding to changes in COX-2 mRNA levels.
*P<0.05 vs basal; #P<0.05 vs IL-1ß alone.