

The in vitro effects of dehydroepiandrosterone on chondrocyte metabolism

許秀蘊

Sun JS;Wu CX;Tsuang YH;Chen LT;Sheu SY

Abstract

OBJECTIVE: To investigate the in vitro effects of dehydroepiandrosterone (DHEA) on neonatal rat chondrocytes. DESIGN: Chondrocytes isolated from neonatal rat cartilage were cultured in three-dimensionally agarose beads and were treated with DHEA. METHODS: Primary culture of chondrocytes was harvested from newborn Wistar rats. The DHEA effects on chondrocyte activities were evaluated by analyzing chondrocyte proliferation, matrix protein synthesis, gene expressions of collagen, matrix metalloproteinase-1, -3 and -13 (MMP-1, -3 and -13), and cyclooxygenase-2 (COX-II), and protein synthesis of interleukin-6 (IL-6), prostaglandin E2 (PGE2) and tissue inhibitor of metalloproteinase-1 (TIMP-1). RESULTS: The DHEA treatment did affect chondrocyte proliferation and glycosaminoglycan (GAG) synthesis. DHEA suppressed the expression of MMP-1, -3 and -13 genes and PGE2 protein synthesis enhanced by lipopolysaccharide (LPS) while the COX-II and inducible nitric oxide synthase (iNOS) gene expressions were down-regulated by DHEA. CONCLUSIONS: Our study demonstrates that DHEA has an ability to modulate the imbalance between MMPs and PGE2 in the neonatal chondrocytes which suggest that it has a potential protective role against articular cartilage damage.