

ESWT down regulates the pathologic mechanisms causing cartilage damage in osteoarthritis

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Device and producing company:

Minilith-SL1, Storz Medical

Introduction:

This study proposed to investigate the effects of ESWT on the metabolism of healthy and osteoarthritic (OA) human chondrocytes (HD).

Methods:

Human articular cartilage was obtained from 9 patients with OA, undergoing joint replacement and from 3 young healthy donors HD with traumatic fracture. After isolation, chondrocytes underwent ESW treatment (electromagnetic generator system, Minilith-SL1, Storz Medical) at different numbers of impulses, energy levels and fluxes.

Chondrocytes were cultured in 24-well plate in DMEM supplemented with 10% FCS for 48 hours and then beta-1-integrin surface expression and intracellular IL-10 and TNF-alfa levels were evaluated by flow-cytometry.

Results:

At baseline, osteoarthritic chondrocytes expressed significantly lower levels of beta-1-integrin and higher levels of IL-10 and TNF-alfa. Following ESW application, while beta-1-integrin expression intracellularly remain unchanged, a significant decrease of IL-10 and TNF-alfa levels was observed both in osteoarthritic and healthy chondrocytes. IL-10 levels decreased at all numbers of impulses and energy levels, while a significant reduction of TNFalfa was mainly found at middle energy levels.

Discussion:

It has been reported that ESW may be useful for treating OA in dogs, and veterinarians have also begun to use ESW to treat OA in horses.

Conclusion:

Our study confirmed that osteoarthritic chondrocytes express low beta-1-integrin and high TNF-alfa and IL-10 levels. ESW treatment application down-regulates the intracellular levels of TNF-alfa and IL-10 by chondrocytes, suggesting that ESW might restore TNF-alfa and IL-10 production by osteoarthritic chondrocytes at normal levels, thus potentially interfering with the pathologic mechanisms causing cartilage damage in OA and representing the theoretical rationale for using ESW as therapy for OA.