Effect of Lysine on Osteoarthritis-related Factors in Human Chondrocyte Culture

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Osteoarthritis, the most common type of arthritis, is a non-inflammatory degenerative joint disease characterized by dysfunction of articular chondrocytes. Lysine, the molecular formula- $C_6H_{14}N_2O_2$, is the amino acid that can enhance the collagen production. In many papers, they use some anti-inflammatory drugs and exercise training to control arthritis and maintain their muscle mass. However, it seems that no research addressed on L-lysine in chondrocyte culture. Therefore, our purpose is to test effect of Lysine on osteoarthritis-related factors in human Chondrocyte Culture.

Human articular cartilage samples were collected from five knee joints. And the chondrocytes were extracted and incubated in the incubator. Each sample was divided into four groups. We use IL-1β to induce cells inflammation overnight. Then, the chondrocytes were treated with L-lysine overnight. Total experiment time is 48 hours. Supernatant were collected. Quantification of cytokines and enzymes was performed using sandwich Enzyme-Linked Immuno-Sorbent Assay (ELISA).

Between the control group and L-lysine group, we found that TNF-α protein is down-regulated significantly after L-lysine treatment. Additionally, in the IL-1 induced experiments, we also found that TNF-α protein production is significantly reduced after L-lysine treatment. Other factor, such as MMP-3 did not show any significant responses.

Type I collagen is present in skin, bone, and tendon, and Type II collagen is present in cartilage. Some reports indicate that L-lysine can further heal bone, tendons, cartilage and connective tissue. L-lysine can down-regulate osteoarthritis-related factors in human chondrocyte culture.