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Effects of orally administered undenatured type II collagen against arthritic inflammatory diseases: a mechanistic exploration.

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Abstract

Arthritis afflicts approximately 43 million Americans or approximately 16.6% of the US population. The two most common and best known types of arthritis are osteoarthritis (OA) and rheumatoid arthritis (RA). A significant amount of scientific research has been done in attempts to explain what initiates forms of arthritis, how it is promoted and perpetuated and how to effectively intervene in the disease process and promote cartilage remodeling. Current pharmacological strategies mainly address immune suppression and antiinflammatory mechanisms and have had limited success. Recent research provides evidence that alterations in the three-dimensional configuration of glycoproteins are responsible for the recognition/response signaling that catalyzes T-cell attack. Oral administration of autoantigens has been shown to suppress a variety of experimentally induced autoimmune pathologies, including antigen-induced RA. The interaction between gut-associated lymphoid tissue in the duodenum and epitopes of orally administered undenatured type II collagen facilitates oral tolerance to the antigen and stems systemic T-cell attack on joint cartilage. Previous studies have shown that small doses of orally administered undenatured type II chicken collagen effectively deactivate killer T-cell attack. A novel glycosylated undenatured type II collagen material (UC-II) was developed to preserve biological activity. The presence of active epitopes in the UC-II collagen is confirmed by an enzyme-linked immunosorbent assay test and distinguishes this form from hydrolyzed or denatured collagen. Oral intake of small amounts of glycosylated UC-II presents active epitopes, with the correct three-dimensional structures, to Peyer's patches, which influences the signaling required for the development of immune tolerance. UC-II has demonstrated the ability to induce tolerance, effectively reducing joint pain and swelling in RA subjects. A pilot study was conducted for 42 days to evaluate the efficacy of UC-II (10 mg/day) in five female subjects (58-78 years) suffering from significant joint pain. Significant pain reduction including morning stiffness, stiffness following periods of rest, pain that worsens with use of the affected joint and loss of joint range of motion and function was observed. Thus, UC-II may serve as a novel therapeutic tool in joint inflammatory conditions and symptoms of OA and RA.

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Safety and efficacy of undenatured type II collagen in the treatment of osteoarthritis of the knee: a clinical trial.

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Source: KGK Synergize Incorporated, London, ON, Canada.

Abstract

Previous studies have shown that undenatured type II collagen (UC-II) is effective in the treatment of rheumatoid arthritis, and preliminary human and animal trials have shown it to be effective in treating osteoarthritis (OA). The present clinical trial evaluated the safety and efficacy of UC-II as compared to a combination of glucosamine and chondroitin (G+C) in the treatment of OA of the knee. The results indicate that UC-II treatment was more efficacious resulting in a significant reduction in all assessments from the baseline at 90 days; whereas, this effect was not observed in G+C treatment group. Specifically, although both treatments reduced the Western Ontario McMaster Osteoarthritis Index (WOMAC) score, treatment with UC-II reduced the WOMAC score by 33% as compared to 14% in G+C treated group after 90 days. Similar results were obtained for visual analog scale (VAS) scores. Although both the treatments reduced the VAS score, UC-II treatment decreased VAS score by 40% after 90 days as compared to 15.4% in G+C treated group. The Lequesne's functional index was used to determine the effect of different treatments on pain during daily activities. Treatment with UC-II reduced Lequesne's functional index score by 20% as compared to 6% in G+C treated group at the end of 90-day treatment. Thus, UC-II treated subjects showed significant enhancement in daily activities suggesting an improvement in their quality of life.