

Use of chondroitin sulphate and glucosamine sulphate in degenerative changes in TMJ: A systematic review

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Introduction: Degenerative changes in Temporomandibular Joint (TMJ) have increased in prevalence and severity over the years. Within this context, it's necessary to obtain safe and effective therapies for control and management of the patient in cases of osteoarthritis and osteoarthrosis of the TMJ. Therapeutic options range from intra-articular infiltration protocols, occlusal splints, pharmacological therapies and physiotherapy and educational measures. The alternative treatment with structure-modifying agents, like as chondroitin and glucosamine sulfates, showed promising results, and especially safety. Thus, through a systematic literature review, this study aimed to analyze and discuss effectiveness and safety of chondroitin and glucosamine in degenerative changes of the TMJ.

Methods: Survey in research bases: MEDLINE, Cochrane, EMBASE, Pubmed, Lilacs and BBO, between the years of 1966 and January 2009, with focus in randomized clinical trial (RCTs) and quasi-randomized clinical trials, systematic reviews and meta-analysis.

Results: After application of the inclusion criteria was reached 2 articles, both randomized controlled double-blind clinical trials, which evaluated the effectiveness of chondroitin and glucosamine in degenerative changes of the TMJ.

Conclusions: There is necessary further RCT, with representative samples and long follow-up time, to obtainment cause-effect relationships more precise and to achieve an objective and effective protocol involving chondroitin and glucosamine in cases of degenerative changes of the TMJ.

Keywords: Chondroitin. Glucosamine. Temporomandibular joint. Temporomandibular disorder. Osteoarthritis. Osteoarthritis.

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Editor's summary

Currently, musculoskeletal diseases represent a great public health problem due to the longevity observed in the world population. Within this context, osteoarthritis is a frequent and important situation of morbidity and disability, especially in the second half of life, increasingly affecting younger patients. Osteoarthritis and osteoarthritis are degenerative diseases that affects joint tissues, causing damage to the articular cartilage, generating painful symptoms and functional limitations. Associated with this condition, there are few therapies with effective results. Therapeutic modalities for the control and management of osteoarthritis are diverse and are related to disease stage, involving patient education, exercise and medication (analgesics and non steroidal anti inflammatory drugs - NSAIDs). Eventually, also the orthopedic surgeries are indicated. In relation to drug therapies, specifically, the treatment is divided into symptoms modifying drugs and structure modifying substances. Symptoms modifying drugs have its performance related to improvement in pain and function, while the structure modifying substances have its indication associated with structural changes in the joint spaces. Thus, the aim of this systematic literature review is the discussion based on scientific evidences regarding to the effectiveness of nutraceuticals, such as glucosamine and chondroitin sulfates, in the treatment of degenerative changes of the TMJ.

After applying the inclusion criteria, it was obtained 2 double-blind randomized clinical trials that evaluated the effectiveness of chondroitin and glucosamine sulfates in the treatment of degenerative changes of the TMJ, as shown in Table 1. The Kappa index of agreement between reviewers was 1.00, with no need to use a third reviewer.

Glucosamine is one of the main pillars of the structural matrix of connective tissue of joints, besides being a substrate for the synthesis of glycosaminoglycans,

stimulating synthesis and inhibiting its degradation. It also has a protective effect in the body against oxidative damage. On the other hand, Chondroitin is a glycosaminoglycan found in articular cartilage proteoglycans. Both compounds are synthesized naturally in each joint. The exact mechanism of action of chondroitin sulfate and glucosamine sulfate in the treatment of osteoarthritis has not been fully elucidated. These substances act synergistically to stimulate glycosaminoglycan synthesis in chondrocytes. Also, combined with the antiprotease action of chondroitin sulfate, provides greater efficacy in delaying the degenerative process. Glucosamine has little effect on the inhibition of aggrecanase and collagenase, enzymes responsible for cartilage degradation. The studies included in this systematic review demonstrate that chondroitin and glucosamine showed better results than NSAIDs and placebo in the treatment of internal changes of the TMJ. The use of chondroitin and glucosamine in other joints of the human body in cases of osteoarthritis/osteoarthritis, such as knees and hips, demonstrate positive results using structure-modifying agents in reducing pain and improving function, being dietary supplements safe and with little or no adverse effects. The systematic literature review showed that are necessary further randomized clinical trials, based on representative samples and long follow-up, to assess the effectiveness and safety of proposed treatments for the control and management of degenerative changes of the TMJ.

REFERENCES

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Table 1 - Characteristics of included studies.

Authors	Study design	Evaluated substance	Sample Size (n)	Evaluation period	Results
Nguyen et al ¹	RCT double-blind and controlled	Chondroitin (400 mg 3 x daily) and glucosamine (500 mg 3 x daily) associated	14 active tt 20 control	12 weeks in patients with internal changes in the TMJ	Improvement in relation to the pain, tenderness in TMJ and joint sounds
Thie et al ²	RCT double-blind and controlled	Glucosamine (500 mg 3 x daily) Ibuprofen (400 mg 3 x daily)	21 tt Glucosamine 18 tt Ibuprofen	90 days in patients with osteoarthritis in the TMJ	Glucosamine more effective in decreasing pain than Ibuprofen