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LITERATURE REVIEW

Efficacy of the use of chondroitin sulphate and glucosamine for the treatment of temporomandibular joint dysfunction: A systematic review and meta-analysis

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ABSTRACT

Objective: To evaluate the efficacy of chondroitin sulfate (CS) and glucosamine (GS), the most relevant drugs of "Symptomatic Slow Acting Drug for Osteoarthritis" (SYSADOA), in the functional and symptomatic improvement of temporomandibular dysfunction. Although, controversy exists regarding their benefit.

Methods: An electronic search was conducted to retrieve randomized controlled clinical trials (RCTs). The risk of bias assessment was evaluated using the Cochrane Collaboration's tool. Data were meta-analyzed with a random effect model whenever possible.

Results: Three RCTs were included. Qualitative results showed a decrease in pain, joint noise, and inflammatory biomarkers in synovial fluid and an improvement in maximum mouth opening without significant adverse effects. Meta-analysis showed a significant increase in maximum mouth opening with the use of CS-GS (p = 0.19). No statistically significant differences were found in pain reduction compared to tramadol.

Conclusion: CS-GS is effective and safe in the symptomatic and functional improvement of patients with TMD.

KEYWORDS

Chondroitin sulfates; glucosamine; temporomandibular joint; temporomandibular joint disc; temporomandibular joint disorders; temporomandibular joint dysfunction syndrome

Introduction

Temporomandibular disorders are a group of musculoskeletal clinical entities encompassing the temporomandibular joint (TMJ), muscles of mastication, and associated orofacial structures [1,2].

Craniomandibular dysfunction or temporomandibular joint dysfunction (TMD) has a multifactorial etiology and includes different conditions. TMD is more common in women [3] and is characterized by the presence of musculoskeletal pain, joint noise, and functional limitation of the TMJ [1,2]. Long-term disc displacement disorders or degenerative diseases such as osteoarthritis, two of the most frequent TMD disorders, can trigger inflammatory and degenerative processes of the joint structures [4,5].

Articular cartilage is a specialized, avascular, nerve-free tissue attached to the subchondral bone. Its characteristics give it the ability to perform the functions of the TMJ, facilitating the coupling between adjacent surfaces, reducing joint friction during movement, and preventing abrasion mechanisms. Thus, articular cartilage provides a strong but elastic load-bearing surface. The main proteoglycan in articular cartilage is the aggrecan, which consists of a core protein with chains of glycosaminoglycans, the most common of which are chondroitin sulfate and keratan sulfate [6,7].

Chondroitin sulfate (CS) is a predominant glycosaminoglycan in the extracellular matrix of cartilage. This glycosaminoglycan is characterized by its properties; it is responsible for hydrating the tissues by attracting water, thus providing strength and elasticity [8,9]. On the other hand, glucosamine (GS) is an amino sugar involved in the biosynthesis of glycosaminoglycan chains and in the metabolism of articular cartilage [10,11].

The treatment of TMD is not straightforward, so its main goal is to relieve pain, reduce inflammation, maintain jaw mobility, and prevent degenerative processes in joint tissues [12,13]. Pharmacological treatment is commonly based on the use of analgesics, non-steroidal anti-inflammatory drugs (NSAIDs), and opioids in cases where pain and inflammation are present. However, chronic use of these drugs may result in systemic adverse reactions such as gastrointestinal, hepatic, renal, and others [14–16].

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