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Effect of glucosamine and chondroitin sulfate in symptomatic knee osteoarthritis: a systematic review and meta-analysis of randomized placebo-controlled trials

Mario Simental-Mendía¹, Adriana Sánchez-García², Félix Vilchez-Cavazos¹, Carlos A Acosta-Olivo¹, Víctor M Peña-Martínez¹, Luis E Simental-Mendía³

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Abstract

Although glucosamine and chondroitin sulfate have showed beneficial effects on joint tissues in osteoarthritis (OA), their therapeutic use in the clinical setting is still debatable. Hence, a systematic review and meta-analysis of randomized placebo-controlled trials was conducted to investigate the efficacy of glucosamine and chondroitin sulfate on knee OA symptoms. Medline, SCOPUS, Web of Science, and Google Scholar databases were searched for randomized placebo-controlled trials evaluating the effect of orally administered glucosamine and/or chondroitin sulfate on OA symptoms using the Western Ontario and McMaster Universities Osteoarthritis index (WOMAC) and/or the Visual Analog Scale (VAS). Meta-analysis was conducted using a random-effects model and generic inverse-variance method. Heterogeneity was tested using the I² statistic index. Treatments with glucosamine and chondroitin were found to significantly reduce pain in VAS [weighted mean difference (WMD) - 7.41 mm, 95% CI - 14.31, - 0.51, p = 0.04 and WMD - 8.35 mm, 95% CI - 11.84, - 4.85, p < 0.00001, respectively]. Their combination did not show this behavior (WMD - 0.28 mm, 95% CI - 8.87, 8.32, p = 0.95). None of the glucosamine, chondroitin or their combination had a significant positive effect on the total WOMAC index and its subscores. Oral supplementation with glucosamine or chondroitin sulfate reduces pain in knee OA. However, there is no additional effect using both therapeutic agents in combination for the management of symptomatic knee OA.

Keywords: Chondroitin sulfate; Glucosamine; Meta-analysis; Osteoarthritis; Visual analog scale; WOMAC.

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