

Effect of Glucosamine Sulfate with or without Omega-3 Fatty Acids in Patients with Osteoarthritis

Advances in Therapy
October 5, 2009; Volume 29; No. 9; pp. 858-871

Joerg Gruenwald, Ellen Petzold, Regina Busch, Heinz-Peter Petzold, Hans-Joachim Graubaum

FROM ABSTRACT

Introduction: A total of 177 patients with moderate-to-severe hip or knee osteoarthritis (OA) were tested over a period of 26 weeks in a two-center, two-armed, randomized, double-blind, comparison study.

The aim was to see if a combination of glucosamine sulfate (1500 mg/day) and the omega-3 polyunsaturated fatty acids eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) (group A), showed equivalence (noninferiority) or superiority as opposed to glucosamine sulfate alone (group B).

Results and Conclusion:

There was a therapeutic and statistical superiority for the combination product of glucosamine sulfate and the omega-3 polyunsaturated fatty acids (group A 44%, group B 32%).

OA symptoms (morning stiffness, pain in hips and knees) were reduced at the end of the study by 48.5%-55.6% in group A and by 41.7%-55.3% in group B.

The reduction was greater in group A than in group B.

In the global safety evaluation, both products have been demonstrated to be very safe in long-term treatment over 26 weeks.



The amount of fish oil used was 1,332 mg, which contained 600 mg omega-3 fatty acids per day.

Symptom severity was rated using a Visual Analog Scale (0=symptom not present and 100=symptom is intolerable).

KEY POINTS FROM THIS ARTICLE:

- 1) Osteoarthritis (OA) affects 9.6% of men and 18% of women aged 60 years or older.
- 2) "OA of the large knee or hip joints is a chronic disease associated with pain and functional limitations, usually leading to invalidism."

- 3) "A chronic imbalance between synthesis and degradation of the cartilage matrix, as observed in OA leads to the typical net loss of articular tissue. For the successful treatment of OA, it is important to adjust this imbalance in the direction of synthesis of new cartilage substance. The combination of glucosamine and omega-3 fatty acids appears to successfully make this adjustment."
- 4) Supplementation with glucosamine sulfate is established as a standard treatment for OA. Clinical studies have shown that glucosamine sulfate can protect cartilage from further degradation. It also provides a decrease in the duration of morning stiffness, improvement of mobility, and reduction of joint swelling, as well as pain reduction and improvement of joint function.
- 5) "A daily dosage of 1.5 g glucosamine sulfate should be applied as a therapeutic agent against OA."
- 6) Fish oil is rich in long-chain omega-3 fatty acids, eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA).
- 7) Long-chain omega-3 fatty acids EPA and DHA can reduce omega-6 arachidonic acid (a precursor for various inflammation mediators), alter gene expression of several pro-inflammatory mediators, and are precursors for resolvins, (a family of anti-inflammatory mediators).
- 8) "The positive influence of omega-3 fatty acids on inflammatory diseases has been shown in several studies."
- 9) Omega-3 fatty acids also increase fibroblasts collagen synthesis.
- 10) Omega-3 fatty acids reduce the amount of the inflammatory mediator prostaglandin E2.
- 11) "Omega-3 fatty acids could modify the processes of degeneration and inflammation, which are typical of OA."
- 12) "Glucosamine sulfate is well established as a standard treatment for OA.
- 13) "Long-chain omega-3 fatty acids have been proven to exhibit anti-inflammatory activity in rheumatoid arthritis."
- 14) Both glucosamine sulfate and omega-3 fatty acids demonstrate high treatment efficacy and safety for knee and hip OA complaints.
- 15) "The combination of glucosamine and omega-3 fatty acids was statistically and clinically significantly superior to glucosamine sulfate."

16) 52.2% of the patients treated with the combination glucosamine plus omega-3s and 37.9% of the patients treated with glucosamine sulfate alone reported a pain score reduction of $\geq 80\%$.

17) Glucosamine sulfate alone showed a less pronounced reduction in all scores than the combination of glucosamine sulfate and the omega-3 fatty acids:

	Glucosamine Sulfate Alone	Glucosamine Sulfate + Omega-3
% With Decreased Pain	65.6%	70.7%
% With Decreased Stiffness	59.7%	63.9%
% With Improved Function	63.9%	68.8%
# With Complete Pain Relief	8	13

18) "Glucosamine sulfate and omega-3 polyunsaturated fatty acids had an additive effect on the measured complaints of knee and hip OA."

19) "While glucosamine sulfate improves cartilage metabolism, the omega-3 fatty acids, EPA and DHA, reduce degradation of cartilage further by reducing the inflammation present in OA."

20) Omega-3 fatty acids can modify the risk of OA.

21) "Recent reviews and meta-analyses concluded that glucosamine hydrochloride is not as effective as glucosamine sulfate."

22) "It is probably that the combination of glucosamine sulfate and omega-3 fatty acids act synergistically, ie, omega-3 fatty acids inhibit the inflammation process in OA, whereas glucosamine sulfate further supports the rebuilding of lost cartilage substance."