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Glucosamine for Osteoarthritis

Glucosamine is sold as a “dietary supplement” in the USA.

Regulation of Dietary Supplements - The Dietary Supplement Health and Education Act passed by the United States Congress in 1994 permits the marketing of a product claimed to affect the structure or function of the body as a “dietary supplement” without the approval of any government agency, as long as the labeling includes a disclaimer saying that it has not been evaluated by the FDA and the product is not intended to diagnose, treat or prevent any disease. If a question about safety arises, the burden of proof is on the FDA, not the manufacturer.

Mechanism of Action - *In vitro*, glucosamine stimulates cartilage cells to synthesize glycosaminoglycans and proteoglycans (C Bassler et al, Int J Tissue React, 14:231, 1992). In animal models, oral glucosamine sulfate has a beneficial effect on inflammation, mechanical arthritis and immunological-reactive arthritis, but much less than that of indomethacin (*Indocin*, and others) (I Setnikar et al, Arzneimittelforschung, 41:542, 1991).

Clinical Use - In short-term controlled trials, glucosamine has been reported to be effective in relieving pain and increasing range of motion in patients with osteoarthritis (MF McCarty, Med Hypothesis, 42:323, 1994). One four-week double-blind trial in 252 patients with osteoarthritis of the knee found oral glucosamine sulfate 500 mg t.i.d. more effective than placebo in relieving symptoms (W Noack et al, Osteoarthritis Cartilage, 2:51, 1994). Another four-week double-blind trial in 200 patients with osteoarthritis of the knee found 500 mg t.i.d. of glucosamine sulfate as effective in relieving symptoms as ibuprofen (Motrin, and others) 400 mg t.i.d. from the second week onward (H Muller-Fassbender et al, Osteoarthritis Cartilage, 2:61, 1994). In a double-blinded eight-week study in 40 patients with osteoarthritis, glucosamine sulfate 500 mg t.i.d. orally was as effective as ibuprofen 400 mg t.i.d. in relieving pain after the first two weeks, and by the end of the trial was more effective (AL Vaz, Curr Med Res Opin, 8:145, 1982). In all reports, the drug was generally well tolerated. Gastrointestinal discomfort and nausea have been reported, but the incidence was no higher than with placebo.

Preparations - Glucosamine is available in pharmacies and health food stores as the sulfate, hydrochloride, n-acetyl or chlorhydrate salt and as the dextrorotatory isomer. It is sometimes combined with chondroitin sulfate, a glycosaminoglycan that has been reported to maintain viscosity in joints, stimulate cartilage repair mechanisms and inhibit enzymes that break down cartilage (VR Pipitone, Drugs Exp Clin Res, 17:3, 1991).

Conclusion - Glucosamine appears to be safe and might be effective for treatment of osteoarthritis, but most published trials of the drug lasted only four to eight weeks and Medical Letter consultants find them unconvincing. As with other “dietary supplements,” the purity of the glucosamine products sold in pharmacies, health food stores and supermarkets in the USA is unknown.