Clinical trials build evidence for chondroitin efficacy in osteoarthritis

by Daniel Uebelhart, MD

Chondroitin sulfate is safe in multiple forms of osteoarthritis, including knee, hip and finger, experts say.

Osteoarthritis therapy controls pain, increases joint and overall mobility, and decreases the progression of osteoarthritis disease. To accomplish these goals, physicians often turn to slow-acting compounds, such as chondroitin sulfate, glucosamine sulfate and hyaluronan (Table).

Also beneficial are physical therapy and rehabilitation medicine or medications such as rapidly acting drug therapy, including analgesics, NSAIDs and uploads. Surgical therapies are an option if drug therapy fails to control the onset of osteoarthritis.

Symptomatic slow-acting drugs used in osteoarthritis treatment (SYSADOAs) act on the algo-functional symptoms of osteoarthritis with delayed onset of action. First effects are realized in a month to six weeks. When administration is stopped, these drugs also have a carry-over effect and could have structure-modifying effects on osteoarthritis.

After three months of regular drug use, clinical efficacy normally continues for the next three months following cessation of SYSADOA administration, therefore presenting a carry-over effect.

Chondroitin sulfate efficacy

The efficacy of oral chondroitin sulfate in knee osteoarthritis is described in several well-documented, prospective, double-blind, placebo-controlled multicenter clinical studies, among them the study by Mazieres et al.[1]

EULAR Recommendations 2003 (Knee Osteoarthritis)

Type	Intervention	Evidence	Recommendation
Non-invasive	Acetaminophen paracetamol	1B	A
Drugs	Conventional NSAIDs	1A	A
	Coxibs	1B	A
	Chondroitin sulfate	1A	A
	Glucosamine sulfate	1A	A
	Topical NSAIDs	1A	A
	Topical capsaicin	1A	A
Non-invasive, non drugs	Patient education	1A	A
	Active physiotherapy	1B	A
Invasive, intra-articular	Steroids	1B	A

Table. In its recommendations for managing knee osteoarthritis, the European League Against Rheumatism (EULAR) graded evidence for chondroitin sulfate as 1A, the highest level of evidence. EULAR graded the strength of its recommendation to use chondroitin sulfate as treatment as A, the highest level of strength of recommendation. *Source: Uebelhart D (adapted from Hordoan KM, et al. Ann Rheum Dis. 2003;62:1145-1155).*

For three months, patients received 1 g per day oral chondroitin sulfate, delivered as two 500-mg doses. The patients had symptomatic knee osteoarthritis.

The primary efficacy outcome of the study was Lequesne's algo-functional index (AFI) for pain and function. Secondary outcomes included pain at rest and with activity, impact on daily living, and NSAID and analgesic consumption. Follow-up lasted for three months.

Chondroitin sulfate led to a significant AFI decrease, compared with placebo. A carry-over effect was also observed in patients who received chondroitin sulfate; positive results were maintained for three to six months after chondroitin-sulfate therapy ended.

Positive results

Another study set out to determine the optimal dose of chondroitin sulfate (pharmaceutical grade) to relieve patients of the painful consequences of knee osteoarthritis.[2] In the double-blind, dose-effect study, patients with symptomatic knee osteoarthritis received placebo or oral chondroitin sulfate at daily doses of 1200 mg, 800 mg or 200 mg.

Patients treated with 800 mg or 1200 mg of chondroitin sulfate showed the greatest reduction in algo-functional index, according to the study.

Other researchers examined the intermittent treatment of knee osteoarthritis with oral chondroitin sulfate in a one-year, randomized, double-blind, multicenter study vs. placebo.[3]

Patients received 800 mg of daily oral chondroitin sulfate or placebo. Over one year, patients received intermittent courses of therapy, alternating between three months of active therapy and three months off therapy.

The researchers also evaluated the carry-over effect of oral chondroitin sulfate (pharmaceutical grade) after a three-month period of treatment. The primary outcomes were pain and mobility of the patient; secondary outcomes were biomarkers and joint space narrowing.

After one year, chondroitin produced a 35% decrease in Lequesne's Index. The decrease became significantly different from placebo results at month nine. After one year, chondroitin also produced a 40% decrease on the Visual Analog Scale for pain.

These results present the possibility of using intermittent doses of chondroitin sulfate to treat patients with mild forms of osteoarthritis.

Proof of action

A total of 11 eligible randomized, controlled trials confirm that oral chondroitin sulfate reduces pain, improves joint function, reduces analgesics and NSAID consumption, and has a carry-over effect. These effects are clearly demonstrated in knee osteoarthritis and further confirmed by recent meta-analyses.[4-6]

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The optimal daily dosage of chondroitin sulfate is 800 mg to 1200 mg. Both continuous and intermittent administration are efficacious.

Efficacy appears dependent upon the source of chondroitin sulfate; however, it is impossible to determine whether chondroitin sulfates derived from the same source but available through different manufacturers are bioequivalent.

Chondroitin sulfate is a well-tolerated SYSADOA, and there are no safety concerns with the regular administration of the drug.

References

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