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File: ■ Turmeric (*Curcuma longa*)
■ Curcumin
■ Osteoarthritis

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RE: Curcumin Formulation Reduced Collagen Biomarker and Disease Activity in Patients with Osteoarthritis

Henrotin Y, Gharbi M, Dierckxsens Y, et al. Decrease of a specific biomarker of collagen degradation in osteoarthritis, Coll2-1, by treatment with highly bioavailable curcumin during an exploratory clinical trial. *BMC Complement Altern Med*. May 17, 2014;14:159. doi: 10.1186/1472-6882-14-159.

Osteoarthritis (OA) is defined by the degradation of joint cartilage over time, leading to pain and loss of mobility. Although the discomfort associated with OA is commonly treated with analgesics or non-steroidal anti-inflammatory drugs (NSAIDs), adverse side effects (ASEs), particularly with chronic usage, necessitate alternative therapies. Curcumin, a compound found in turmeric (*Curcuma longa*), has been reported to have anti-inflammatory activity.[1] This observational trial investigates a "bio-optimized" treatment using curcumin along with polysorbate; cartilage metabolism and inflammation biomarkers, as well as pain and disease activity endpoints, were assessed in patients with knee OA.

This study took place at Citadelle Hopital of Liège, Belgium, and patients with OA, either male or female, between the ages of 45 and 75 years old and with symptoms > 6 months in duration were included. These patients consented abstaining from NSAIDs or other pain medication during the study, except acetaminophen at a 4 g/day maximum. Included patients also had Kellgren and Lawrence (K&L) measurements (a scale based on severity of arthritis bone formations known as osteocytes) during the year prior to the study, had ACR (American College of Rheumatology) evaluations, and medial femorotibial gonarthrosis (arthritis of the knee). Exclusionary criteria included OA complications or other causes of joint problems, taking medications such as NSAIDs or corticosteroids, not responding to OA pharmaceuticals or dietary supplements designed to work slowly, low tolerance for the treatment, those with other chronic illness, those who were pregnant or lactating, or those who were premenopausal and not using contraception.

Patients took Flexofytol® (capsules of 42 mg of curcumin with the polysorbate Tween® 80; Tilman SA; Baillonville, Belgium). The dosage was 3 capsules in the morning before

food and 3 at night for 3 months. Patients were instructed not to take acetaminophen 48 hours before the study visits. After the initial baseline visit, there were 4 other visits after 1, 2, 4, and 12 weeks; a 100 mm visual analog scale (VAS) was used to gauge pain during the previous 24 hours and global "disease activity." Blood was taken at the baseline visit and at the 14- and 84-day visits, and investigators took note of any ASEs and other treatments used by patients. Concentrations of collagen or cartilage degradation, inflammation, or OA specific markers Coll2-1, Coll2-1NO_2, Fib3-1, Fib3-2, C-reactive protein (CRP), CTX-II, and myeloperoxidase were assessed.

In total, 22 patients were enrolled in this study, with 7 men and 15 women participating. Patients ranged in age from 49 to 77 years old, with ongoing pain. More than half (59.1%) of patients had night pain, and 31.8% had knee effusion (swelling). K&L assessment showed moderate-to-severe OA in 81.8% of enrolled patients. During the study, 2 patients dropped out due to diarrhea, nausea, or vomiting after 14 and 28 days, respectively, leaving a total of 20 patients that completed the study. After 84 days of treatment, 25% of patients experienced ASEs, consisting of gastrointestinal discomforts that were considered "minor."

Following 84 days of treatment, Coll2-1 concentrations were significantly reduced as compared to baseline (257.84 ± 52.78 vs. 302.21 ± 53.78 nmol/l, P=0.002). Although CRP decreased by 77% at the end of the study, this was not significant; the large variation at baseline (10.42 ± 30.27 mg/l) was thought to be the reason that the change was not statistically significant. No other OA markers were significantly affected. Also, the disease activity was significantly decreased after 84 days of treatment as compared to baseline (38.85 ± 27.66 vs. 60.00 ± 22.67, P=0.0047), based on patients' subjective VAS assessments. Pain, also as measured on the VAS, decreased by the end of the study, but this was not significant.

This study shows that a marker of collagen degradation and overall disease activity were significantly reduced in patients with OA supplemented with curcumin. Although not significantly, CRP and pain were also decreased, suggesting further studies addressing inflammation and discomfort. Weaknesses of this study include the absence of serum measurements of curcumin or metabolites to determine efficient bioavailability, and the omission of mobility testing to gauge functional impacts of curcumin intake on OA. Also, the dosage may need further investigation as a large percentage of patients reported ASEs. Regardless, curcumin may prove an effective adjuvant for current therapy for patients with OA.

—Amy C. Keller, PhD

Reference

[1]Blumenthal M, Goldberg A, Brinckmann J, eds. *Herbal Medicine: Expanded Commission E Monographs*. Austin, TX: American Botanical Council; Newton, MA: Integrative Medicine Communications; 2000.

Referenced article can be found at http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4032499/.