



ANTI AGING / HEALTHY AGING

## Turmeric for Knee Osteoarthritis

A RESEARCH-SUPPORTED ALTERNATIVE TO NSAIDS

Adrian Isaza, PhD, DC, DABCI, DACBN, CCAP | DIGITAL EXCLUSIVE

### WHAT YOU NEED TO KNOW

- OA of the knee should be prevented and treated innovatively, especially among young people.
- A NSAID is often applied topically or orally as a first line of treatment, but adverse effects should be monitored.
- Based on numerous studies, it seems feasible to treat knee osteoarthritis with curcuminoids due to its efficacy and safety compared to NSAIDs.

In osteoarthritis (OA), chronic wear and tear leads to degeneration of articular cartilage and underlying bone. This condition usually affects elderly individuals, but can be accelerated by joint pathologies and abnormal biomechanics, including an elevated body-mass index on joints.

Over half of the people with symptomatic knee OA have advanced OA: approximately 14 million people worldwide. More than 3 million African Americans, Hispanics, and others are among these individuals. The number of adults younger than 45 years old and those between 45 and 65 years old who have symptomatic knee OA constitute nearly 2 million cases.

OA of the knee should be prevented and treated innovatively, especially among young people, based on these data.<sup>1</sup> OA should be managed non-pharmacologically first, and then pharmacologically or surgically only if necessary.

#### Research on NSAIDs

A NSAID is often applied topically or orally as a first line of treatment, but adverse effects should be monitored. Researchers studied seven clinical trials comparing NSAIDs with acetaminophen in 2004. This study showed no statistical difference between the groups treated with NSAIDs and

acetaminophen in terms of discontinuation due to adverse events.<sup>2</sup>

An analysis of over 26,000 participants from 72 randomized, controlled trials was conducted in 2020 by Osani, et al. From four weeks on, NSAIDs were significantly more likely than placebo to cause gastrointestinal (GI) adverse events (relative risk: 1.38).<sup>3</sup>

Last, but not least, in 2021, Da Costa, et al., performed a meta-analysis involving 192 trials and more than 100,000 participants. Dropout rates due to adverse events were 18.5% and 83.3% for oral NSAIDs and opioids, respectively. There was an increased risk of adverse events associated with 29.8% of oral NSAIDs and 89.5% of opioids, respectively. When oxymorphone was taken at 80 mg/day, adverse events were responsible for the highest dropout rates (51%).<sup>4</sup>

With that said, let's evaluate turmeric as a possible alternative to oral NSAIDs for the treatment of knee osteoarthritis.

### Turmeric as an Alternative

An analysis of eight randomized, controlled trials was conducted by Daily, et al., in 2016, with turmeric extract as a treatment for arthritis (about 1,000 mg/day of curcumin) proven to be effective. Three studies (mean difference: -2.04) found a reduction in pain visual analog scale (PVAS) when turmeric / curcumin was used in comparison with placebo.<sup>5</sup>

A systematic review and meta-analysis by Onakpoya and colleagues was published in 2017. Over 700 patients were involved in seven randomized, controlled trials. A significant reduction in knee pain was achieved with curcuminoids (standardized mean difference: -3.45), and quality of life was improved (Lequesne Pain-Function Index): mean difference: -2.69.<sup>6</sup>

An analysis of 10 studies was conducted by Dai, et al., in 2021 involving more than 700 participants in randomized, controlled trials. Comparing *Curcuma longa* extract with placebo for knee OA, the pooled analysis showed significantly better pain relief and functional improvement vs. placebo.<sup>7</sup>

### Turmeric vs. NSAIDs: Head to Head

An analysis of 11 randomized, controlled trials with 1,000-plus participants was conducted in 2018 by Bannuru, et al. Patients receiving curcuminoids were significantly less likely to experience gastrointestinal adverse events than those taking NSAIDs; efficacy outcomes showed no statistically significant differences between the two.<sup>8</sup>

An analysis of 11 randomized, controlled trials involving more than 1,200 participants was conducted in 2021 by Hsiao, et al. Curcuminoids were found to have a significant difference in visual analog scale (VAS) pain scores when compared to NSAIDs. The included studies all reported higher adverse events rates when NSAIDs were used.<sup>9</sup>

A systematic review of 10 studies was published by Paultre, et al., in 2021. From baseline, turmeric therapy improved pain and function in all 10 studies. There were no differences in outcome scores between turmeric and NSAIDs in three studies. Studies in which turmeric therapy was used did not show any negative side effects.<sup>10</sup>

An analysis involving more than 1,800 participants in 16 randomized, controlled trials was conducted by Wang, et al., in 2021. Turmeric extracts significantly reduced knee pain (SMD - 0.82)

and improved physical function (SMD - 0.75) compared to placebo, and had similar effects compared to NSAIDs. Turmeric extracts had 12% fewer adverse events than NSAIDs and similar rates to placebo.<sup>11</sup>

A systematic review of 15 randomized, controlled trials was completed in 2022 by Feng, et al., with over 1,600 patients involved overall. The VAS score for pain was significantly improved by curcuminoids when compared to placebo (WMD: -1.77). Curcuminoids also improved function as well as pain in comparison with NSAIDs. The incidence of adverse events (AEs) was not significantly increased by curcuminoids compared with placebo (RR: 1.03).<sup>12</sup>

Last, But Not Least...

One more study is worth mentioning in terms of the efficacy of turmeric for the treatment of knee osteoarthritis. A pilot, double-blind placebo-controlled study was conducted in 2014 by Panahi, et al. Forty patients with mild-to-moderate knee pain were enrolled in a parallel-group research study for knee arthritis. Three divided doses of 1,500 mg of curcuminoids were administered to patients for six weeks. Compared with placebo, curcuminoids reduced WOMAC and VAS scores significantly more than curcuminoids alone. Neither group experienced any significant adverse effects.<sup>13</sup>

### Clinical Takeaway

Based on these studies, it seems feasible to treat knee osteoarthritis with curcuminoids due to its efficacy and safety compared to NSAIDs. Further studies are warranted to support these findings.

### References

1. Deshpande BR, Katz JN, Solomon DH, et al. Number of persons with symptomatic knee osteoarthritis in the us: impact of race and ethnicity, age, sex, and obesity. *Arthritis Care Res*, 2016;68(12):1743-1750.
2. Lee C, Straus WL, Balshaw R, et al. A comparison of the efficacy and safety of nonsteroidal anti-inflammatory agents versus acetaminophen in the treatment of osteoarthritis: a meta-analysis. *Arthritis Rheum*, 2004;51(5):746-754
3. Osani MC, Vaysbrot EE, Zhou M, et al. Duration of symptom relief and early trajectory of adverse events for oral nonsteroidal anti-inflammatory drugs in knee osteoarthritis: a systematic review and meta-analysis. *Arthritis Care Res*, 2020;72(5):641-651.
4. da Costa BR, Pereira TV, Saadat P, et al. Effectiveness and safety of non-steroidal anti-inflammatory drugs and opioid treatment for knee and hip osteoarthritis: network meta-analysis. *BMJ*, 2021;375:n2321.
5. Daily JW, Yang M, Park S. Efficacy of turmeric extracts and curcumin for alleviating the symptoms of joint arthritis: a systematic review and meta-analysis of randomized clinical trials. *J Med Food*, 2016;19(8):717-729.
6. Onakpoya IJ, Spencer EA, Perera R, Heneghan CJ. Effectiveness of curcuminoids in the treatment of knee osteoarthritis: a systematic review and meta-analysis of randomized clinical trials. *Int J Rheum Dis*, 2017;20(4):420-433.
7. Dai W, Yan W, Leng X, et al. Effectiveness of Curcuma longa extract versus placebo for the treatment of knee osteoarthritis: a systematic review and meta-analysis of randomized controlled trials. *Phytother Res*, 2021;35(11):5921-5935.
8. Bannuru RR, Osani MC, Al-Eid F, Wang C. Efficacy of curcumin and Boswellia for knee osteoarthritis: systematic review and meta-analysis. *Semin Arthritis Rheum*, 2018;48(3):416-429.
9. Hsiao AF, Lien YC, Tzeng IS, et al. The efficacy of high- and low-dose curcumin in knee osteoarthritis: a systematic review and meta-analysis. *Complement Ther Med*, 2021;63:102775

10. Paultre K, Cade W, Hernandez D, et al. Therapeutic effects of turmeric or curcumin extract on pain and function for individuals with knee osteoarthritis: a systematic review. *BMJ Open Sport Exerc Med*, 2021;7(1):e000935.
11. Wang Z, Singh A, Jones G, et al. Efficacy and safety of turmeric extracts for the treatment of knee osteoarthritis: a systematic review and meta-analysis of randomised controlled trials. *Curr Rheumatol Rep*, 2021;23(2):11.
12. Feng J, Li Z, Tian L, et al. Efficacy and safety of curcuminoids alone in alleviating pain and dysfunction for knee osteoarthritis: a systematic review and meta-analysis of randomized controlled trials. *BMC Complement Med Ther*, 2022;22(1):276.
13. Panahi Y, Rahimnia AR, Sharafi M, et al. Curcuminoid treatment for knee osteoarthritis: a randomized double-blind placebo-controlled trial. *Phytother Res*, 2014;28(11):1625-1631.

JULY 2023