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File: ■ Turmeric (*Curcuma longa*)
■ Curcumin
■ Prostate Cancer

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RE: Curcumin Reduces Radiation-induced Urinary Symptoms in Patients with Prostate Cancer

Hejazi J, Rastmanesh R, Taleban F-A, Molana S-H, Ehtejab G. A pilot clinical trial of radioprotective effects of curcumin supplementation in patients with prostate cancer. *J Cancer Sci Ther.* 2013;5(10):320-324.

Radiation therapy by itself or in conjunction with surgery and hormonal medications is the main treatment of prostate cancer. Although high-dose radiation is the standard of care, the adverse effects (AEs) it causes decrease quality of life (QoL) to such an extent that they are dose limiting. There is an urgent need for adjuvant therapies that can reduce the adverse symptom burden. Turmeric (*Curcuma longa*) rhizome is commonly used for gastrointestinal problems, and curcumin (the most abundant curcuminoid constituent of turmeric) is reported to have both anti-inflammatory and antioxidant activity.¹ Experimental studies have also shown that curcumin protects against the tissue damage caused by radiation and that it enhances the effects of radiotherapy. This randomized, double-blind, placebo-controlled pilot trial investigated the radioprotective effects of a curcuminoid preparation against the AEs of radiation treatment in those with prostate cancer.

All patients diagnosed with localized prostate cancer at the Department of Oncology at Besat Hospital, Tehran, Iran between March 2011 and March 2013 were assessed for eligibility. Included patients had histologically confirmed prostate cancer, were referred for radiation therapy in combination with hormone ablation, and had a life expectancy \geq 5 years. Patients were excluded if they had metastasized cancer, previously undergone prostate cancer treatment or surgery, stage T3 or T4 prostate cancer, Gleason score \geq 8 (based upon histological assessment), serum prostate-specific antigen (PSA, a marker of prostate cancer) levels \geq 20 ng/ml, were enrolled in another clinical trial, had a gastrointestinal disorder, or allergies to curcumin.

Baseline assessments included a physical examination, medical history, complete blood count and PSA levels, body mass index, a food frequency questionnaire to evaluate food intake, and magnetic resonance imaging (MRI). To measure QoL, the European Organisation for Research and Treatment of Cancer (EORTC) questionnaire for prostate

cancer (QLQ-PP25) was used to assess treatment-related symptoms and urinary, gastrointestinal, and sexual function.

Curcumin (BCM-95[®]) was provided in 500 mg capsules from Arjuna Natural Extracts Ltd; Kerala, India. Capsules contained 440 mg of curcuminoids (347 mg curcumin, 84 mg desmethoxycurcumin, and 9 mg bisdesmethoxycurcumin) and 38 mg of turmeric essential oil. Placebo capsules consisted of 500 mg of roasted rice (*Oryza sativa*) flour. Starting a week prior to the initiation of radiotherapy and lasting until the radiation treatment was finished (5 times a week for approximately 8 weeks), the patients took 2 capsules with each meal for a total dose of 3 g per day of either curcumin or placebo. The baseline assessments were conducted again 3 months after radiation treatment was completed.

Of the 78 eligible patients, 45 agreed to participate; after randomization, there were 22 in the treatment group and 23 in the placebo group. There were no significant differences between groups at baseline in the 4 QoL subclasses (urinary symptoms, bowel symptoms, treatment-related symptoms, and sexual functioning). During the study, 2 patients in the treatment group and 3 patients in the placebo group withdrew, leaving 40 patients that completed the study. Reasons for dropouts were not specified.

Increases in urinary symptoms from baseline to the end of the study were significantly less ($P=0.011$) in the treatment group (16.2 ± 6.5 vs. 24.2 ± 15.8) as compared to the placebo group (18.8 ± 5.6 vs. 38.7 ± 16.3); scores for frequency of urination, sleep disruptions, urine leakage, and interference of daily routines were all lower in the curcumin group. There were no significant differences in the other QoL subclasses. The 40 patients who completed the study took all of their supplements, there were no missing answers on the questionnaires, and no AEs were reported.

In summary, radiation-induced adverse urinary symptoms were attenuated in patients with prostate cancer consuming 3 g daily of the curcuminoid mixture for 20 weeks. The curcumin treatment did not significantly diminish gastrointestinal, radiation-treatment-related, or sexual AEs, although there was a trend towards improvement in the latter. In the literature, there are conflicting opinions whether antioxidants may decrease the effectiveness of radiation therapy, but the MRI and PSA data collected in this study do not show any significant differences in efficacy between the control and treatment groups. The authors speculate that higher curcumin doses may have better protective effects.

Limitations of this study include the relatively small sample size and short trial duration. Further clinical research enrolling larger patient populations is necessary to establish the radioprotective effects of curcumin, and its optimum dosage in patients with prostate cancer. The authors report that they are currently conducting investigations of the molecular mechanisms of curcumin's radioprotective effects on normal tissues and its radiosensitization effects on tumor cells.

—Amy C. Keller, PhD

Reference

¹Blumenthal 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 www.omicsonline.org/a-pilot-clinical-trial-of-radioprotective-effects-of-curcumin-supplementation-in-patients-with-prostate-cancer-1948-5956.1000222.php?aid=19259.

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