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Effects of yoga in men with prostate cancer on quality of life and immune response: a pilot randomized controlled trial

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Abstract

Background: Diagnosis and treatment of prostate cancer is associated with anxiety, fear, and depression in up to one-third of men. Yoga improves health-related quality of life (QoL) in patients with several types of cancer, but evidence of its efficacy in enhancing QoL is lacking in prostate cancer.

Methods: In this randomized controlled study, 29 men newly diagnosed with localized prostate cancer were randomized to yoga for 6 weeks ($n = 14$) or standard-of-care ($n = 15$) before radical prostatectomy. The primary outcome was self-reported QoL, assessed by the Expanded Prostate Index Composite (EPIC), Functional Assessment of Cancer Therapy-Prostate (FACT-P), Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-F), Functional Assessment of Cancer Therapy-General (FACT-G) at baseline, preoperatively, and 6 weeks postoperatively. Secondary outcomes were changes in immune cell status and cytokine levels with yoga.

Results: The greatest benefit of yoga on QoL was seen in EPIC-sexual (mean difference, 8.5 points), FACIT-F (6.3 points), FACT-Functional wellbeing (8.6 points), FACT-physical wellbeing (5.5 points), and FACT-Social wellbeing (14.6 points). The yoga group showed increased numbers of circulating CD4+ and CD8+ T-cells, more production of interferon-gamma by natural killer cells, and increased Fc receptor III expression in natural killer cells. The yoga group also showed decreased numbers of regulatory T-cells, myeloid-derived suppressor cells, indicating antitumor activity, and reduction in inflammatory cytokine levels (granulocyte colony-stimulating factor [0.55 (0.05-1.05), $p = 0.03$], monocyte chemoattractant protein [0.22 (0.01-0.43), $p = 0.04$], and FMS-like tyrosine kinase-3 ligand [0.91 (-0.01, 1.82), $p = 0.053$].

Conclusions: Perioperative yoga exercise improved QoL, promoted an immune response, and attenuated inflammation in men with prostate cancer. Yoga is feasible in this setting and has benefits that require further investigation.

Trial registration: [clinicaltrials.org](#) ([NCT02620033](#)).

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