

The Effect of Vitamin D Supplementation on Prostate Cancer: A Systematic Review and Meta-Analysis of Clinical Trials

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Abstract : Background and Objectives: Vitamin D has received attention for its potential to disrupt cancer processes such as attenuating cell proliferation and exacerbating differentiation and apoptosis. However, whether there exists a role for vitamin D in the treatment of prostate cancer specifically remains controversial. We systematically review the literature to assess whether supplementation with vitamin D influences PSA response and overall survival in patients with prostate cancer. Methods: We searched PubMed, Scopus, ISI Web of Science and Google scholar from inception through up to 10 September 2017 for both before-and-after and randomized trials that evaluated the effect of vitamin D supplementation on the prostate specific antigen (PSA) response rate in participants with prostate cancer. The DerSimonian and Laird, inverse-weighted random-effects model was used to pool effect estimates from the studies. Heterogeneity and potential publication bias were evaluated. Subgroup analyses were also performed. Results: Twenty-two studies (16 before-after and 6 randomized controlled trials) were found and included in meta-analysis. The analysis on controlled clinical trials revealed that PSA change from baseline [weighted mean difference (WMD) = -1.66 ng/ml, 95%CI: -0.69, 0.36, P= 0.543], PSA response (RR=1.18, 95%CI: 0.97, 1.45, P=0.104) and mortality rate (risk ratio (RR) = 1.05, 95% CI: 0.81-1.36; P=0.713) was not significantly different between vitamin D supplementation and placebo groups. Single arm trials revealed that vitamin D supplementation had had a modest effect on PSA response rate: 19% of those enrolled had at least a 50% reduction in PSA by the end of treatment (95% CI: 7% to 31%; p=0.002). Conclusion: We found that vitamin D modestly increases the PSA response rate in single arm studies. No effect on serum PSA levels, PSA response and mortality was seen in randomized controlled clinical trials. It does not seem patients with prostate cancer benefit from vitamin D supplementation.

Keywords : mortality, prostatic neoplasms, PSA response, vitamin D

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