



PROSTATE CANCER

New data on risks of selenium and vitamin E

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Two studies recently published in the *Journal of the National Cancer Institute* shed light on the associations between selenium, vitamin E and risk of prostate cancer. The first study, from the USA, reveals that supplementation of both micronutrients can increase risk of prostate cancer, depending on selenium levels at baseline. The second study, from the Netherlands, suggests that high selenium status (without supplementation) protects against prostate cancer.

As the name suggests, the Selenium and Vitamin E Cancer Prevention Trial (SELECT) was originally devised to analyse the proposed roles of selenium and vitamin E for the prevention of prostate cancer, based on their antioxidant properties; however, the trial was discontinued after 3 years owing to lack of clear benefit. Final analysis of the data in 2011 confirmed that selenium supplementation had no effect on prostate cancer risk, but revealed higher rates of prostate cancer detection in men who received vitamin E alone than in those who received placebo.

Now, researchers have revisited the SELECT data to investigate the effect of baseline selenium status on prostate cancer risk. They performed a case-cohort study of 31,117 men included in SELECT, who gave toenail samples prior to randomization, and found that baseline toenail selenium concentration did not correlate with prostate cancer risk. However, the effects of supplementation with selenium or vitamin E differed depending on selenium status at baseline.

Men with high baseline toenail selenium concentrations who received selenium supplementation (either alone or in combination

with vitamin E) were twice as likely to develop high-grade (Gleason 7–10) prostate cancer than those who received placebo. Selenium supplementation did not affect prostate cancer risk in men with low baseline levels.

Conversely, vitamin E supplementation was associated with risk of prostate cancer in men with low, but not high, baseline selenium status. Men with low baseline selenium concentrations who received vitamin E alone were 46% and 111% more likely to develop low-grade and high-grade prostate cancer, respectively, than those who received placebo.

New findings from The Netherlands Cohort study tell a slightly different story. Using data from this large population-based study of the associations between diet and cancer, investigators found that higher baseline toenail selenium levels were associated with a reduced risk of prostate cancer. In addition, they report that variation in the genes that encode two selenoproteins—*SEPP1* and *GPXI*—have no effect on prostate cancer risk.

Clearly, the relationships between selenium, vitamin E and prostate cancer are complicated, and more work needs to be done to fully understand the effects of supplementation. At this time, selenium and vitamin E supplementation cannot be recommended.

Sarah Payton

Original articles Kristal, A. R. *et al.* Baseline selenium status and effects of selenium and vitamin E supplementation on prostate cancer risk. *J. Natl Cancer Inst.* doi:10.1093/jnci/djt456 | Geybels, M. S. *et al.* Selenoprotein gene variants, toenail selenium levels, and risk of advanced prostate cancer. *J. Natl Cancer Inst.* doi:10.1093/jnci/dju003