Selenoprotein and antioxidant genes and the risk of high-grade prostate cancer and prostate cancer recurrence.


**Abstract**

**BACKGROUND:** Observational studies suggest an inverse association between selenium and risk of prostate cancer. However, randomized controlled trials of selenium supplementation have reported conflicting results. Thus, we examined plasma selenium and selenium-related genes in relation to risk of high-grade prostate cancer and prostate cancer recurrence among men initially diagnosed with non-metastatic disease.

**METHODS:** We measured plasma selenium and genotyped 73 single nucleotide polymorphisms in TXNRD1, TXNRD2, GPX1, GPX3, GPX4, SEP15, SEPP1, SELENBP1, OGG1, and CAT among 568 men with non-metastatic prostate cancer who underwent radical prostatectomy. We examined associations between plasma selenium, genotypes, and risk of high-grade prostate cancer (Gleason grade ≥8 or 7 with primary score ≥4; n = 111) using logistic regression, and risk of prostate cancer recurrence (61 events; 3.8 y median follow-up) using Cox proportional hazards regression.

**RESULTS:** Plasma selenium was not associated with risk of high-grade prostate cancer or prostate cancer recurrence. Less common alleles of rs11913319 in TXNRD2 and rs125701 in OGG1 were associated with an increased risk of high-grade prostate cancer. We observed associations between the risk of prostate cancer recurrence and multiple SNPs in TXNRD1, TXNRD2, GPX3, and SEP15. These associations were no longer statistically significant after adjustment for multiple comparisons.

**CONCLUSIONS:** Among men with non-metastatic prostate cancer, there is suggestive evidence that genetic variation in selenoproteins and related antioxidant enzymes may be associated with risk of high-grade disease at diagnosis and prostate cancer recurrence. Prostate 75:60-69, 2015. © 2014 Wiley Periodicals, Inc.

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**KEYWORDS:** Gleason grade; genetic polymorphisms; selenium