The Prostate Cancer Prevention Trial risk calculator and the relationship between prostate-specific antigen and biopsy outcome.

Memorial Sloan-Kettering Cancer Center, New York, New York.

Abstract

BACKGROUND: The Prostate Cancer Prevention Trial (PCPT) Risk Calculator is a widely used prediction tool for aiding decisions about biopsy for prostate cancer. This study hypothesized that recently reported differences between predictions from the model and findings from other cohorts were due to how prostate-specific antigen (PSA) was entered into the statistical model, and to the inclusion of protocol end-of-study biopsies for which there was no clinical indication.

METHODS: Data was obtained from the 5088 PCPT participants and was used to construct the PCPT Risk Calculator. The relationship between PSA and the risk of a positive biopsy was modeled by using locally-weighted regression (lowess), an empirical estimate of actual risks observed which does not depend on a statistical model. Risks were estimated with and without the 3514 end-of-study biopsies.

RESULTS: For PSA levels above biopsy thresholds (~4 ng/mL), the PCPT Risk Calculator greatly overestimated actual empirical risks (eg, 44% versus 26% at 5 ng/mL). The change in risk with increasing PSA was less among for-cause biopsies compared with the end-of-study biopsies (P = .001). Risk of high-grade disease was overestimated at PSA level of ≥ 6 ng/mL.

CONCLUSIONS: The PCPT Risk Calculator overestimates risks for PSAs close to and above typical biopsy thresholds. Separating for-cause biopsies from end-of-study biopsies and using empirical rather than model-based risks reduces overall risk estimates and replicates prior findings that, in men who have been screened with PSA, there is no rapid increase in prostate cancer risk with higher PSA. Revision of the PCPT Risk Calculator should be considered. Cancer 2013. © 2013 American Cancer Society.

© 2013 American Cancer Society.

PMID: 23720006 [PubMed - as supplied by publisher]