Changes in serum prostate-specific antigen levels and the identification of prostate cancer in a large managed care population.

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Abstract

OBJECTIVE: To determine whether the rate of change in total serum prostate-specific antigen (PSA) levels accurately detects prostate cancer and to evaluate whether it adds any predictive value to a single measurement of serum PSA alone, in general practice settings.

MATERIALS AND METHODS: A retrospective cohort of 219,388 community-dwelling men, aged ≥45 years, enrolled in the Kaiser Permanente Southern California health plan, with no history of prostate cancer and at least three PSA measurements, were followed from 1 January 1998 to 31 December 2007, for the development of biopsy-confirmed prostate cancer. Annual percent changes in total serum PSA levels were estimated using linear mixed models. The accuracy of prostate cancer prediction was assessed for prostate cancer overall and for aggressive disease (Gleason score ≥7) and compared with that of a single measure of PSA level using area under the receiver-operating characteristic curves (AUCs).

RESULTS: The men in this cohort experienced a mean change of 2.9% in PSA levels per year and the rate of change in PSA increased modestly with age (P ≤ 0.001). Annual percent changes in PSA accurately predicted the presence of prostate cancer (AUC = 0.963) and aggressive disease (AUC = 0.955) and had more predictive accuracy for aggressive disease than did a single measurement of PSA alone (AUC = 0.727).

CONCLUSIONS: Longitudinal measures of PSA improve the accuracy of aggressive prostate cancer detection when compared with a single measurement of PSA alone. Findings from this study provide insight into the usefulness of PSA velocity as a detection marker for aggressive prostate cancer.

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