

MEDICAL ONCOLOGY

PSA is best outcome predictor

Prostate-specific antigen (PSA) levels and PSA dynamics that change over time are used to stratify patients' risk of prostate cancer and predict their response to treatment. Mathematical models have been used to calculate PSA dynamics such as PSA doubling time or PSA velocity; however, no studies have compared different ways of calculating these variables in the same group of patients, nor investigated whether PSA dynamics improve outcome prediction compared with a single PSA measurement. O'Brien *et al.* demonstrate that PSA dynamics calculated by various definitions does not enhance outcome prediction beyond single pretreatment PSA levels alone.

The researchers assessed which pretreatment definitions of PSA doubling time and PSA velocity are associated with outcome in patients treated with radical prostatectomy. They also determined whether PSA dynamics improve the accuracy of prediction beyond PSA

measurement alone and assessed whether PSA dynamics improve the accuracy of prediction compared with established clinical parameters such as tumor grade, Gleason score, and pretreatment PSA levels.

The cohort included 2,938 patients with two or more pretreatment PSA values. Single PSA measurement is significantly associated with both recurrence and metastasis. Two of 12 PSA doubling time definitions and four of 10 PSA velocity definitions are significantly associated with biochemical recurrence and metastasis. One PSA doubling time and one PSA velocity definition is superior to PSA alone for predicting biochemical recurrence; however, in both cases the improvements in prediction accuracy are small and the confidence intervals are wide. The researchers conclude that these findings constitute insufficient evidence to indicate that PSA dynamics enhance prediction of biochemical recurrence or metastases

compared with a single pretreatment PSA measurement. When PSA dynamics are analyzed in low-risk subgroups, none of the PSA definitions improve prediction accuracy compared with established clinical parameters used in the Kattan preoperative nomogram.

In their paper, the researchers comment, "Although PSA velocity and PSA doubling time by several definitions are univariately associated with both biochemical recurrence and metastasis after radical prostatectomy, the accuracy of most published PSA velocity and PSA doubling time definitions for predicting outcome is less than that of PSA alone."

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Original article O'Brien, M. F. *et al.* Pretreatment prostate-specific antigen (PSA) velocity and doubling time are associated with outcome but neither improves prediction of outcome beyond pretreatment PSA alone in patients treated with radical prostatectomy. *J. Clin. Oncol.* **27**, 3591-3597 (2009).