Prostate-specific antigen levels in men aged 60–70 and development of lethal prostate cancer over 30 years: Implications for risk-stratified screening

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Introduction: We sought to determine if a pre-diagnostic prostate-specific antigen (PSA) level in men aged 60–70 years predicts future risk of lethal prostate cancer and could be used to risk-stratify screening, potentially allowing men at low risk to be exempt from further screening.

Methods: We conducted a nested case-control study among men aged 60 (57.5–62.5), 65 (62.5–67.5), and 70 (67.5–72.5) years who gave blood before enrollment in the Physicians' Health Study of primarily white, U.S. male physicians initiated in 1982. Baseline PSA levels were available for 109 lethal prostate cancer cases that were matched to 327 age-matched controls or non-lethal prostate cancer cases. Lethal was defined as metastatic (to bones or distant organs) or fatal prostate cancer. Conditional logistic regression was used to estimate odds ratios (ORs) with 95% confidence intervals (CIs), of the association between PSA and risk of lethal disease.

Results: Median PSA (ng/mL) among controls was 1.10 for men aged 60, 1.51 for men aged 65, and 1.52 for men aged 70. The 90th percentile of PSA levels among controls was 3.97 for men aged 60, 5.38 for men aged 65, and 5.17 for men aged 70. Median time from blood draw to lethal event among lethal cases was 15.3 years. Risk of lethal prostate cancer was strongly associated with baseline PSA levels: ORs (95% CIs) comparing PSA in the >90th percentile vs. ≤median were 7.5 (2.9, 19.1) for men aged 60, 19.3 (4.5, 82.0) for men aged 65, and 11.4 (3.0, 44.2) for men aged 70. 87% of lethal cases were in men with baseline PSA above the median (Table 1).

Conclusions: Pre-diagnostic PSA level at age 60–70 strongly predicts future risk of lethal prostate cancer in a U.S. cohort subject to opportunistic screening. This supports risk-stratified screening, with consideration of exempting men with PSA below the median at age 60 onwards from further screening.

Conflict of Interest: Mark Preston, none.

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