Prostate Cancer Screening with PSA
A Study of Potential Negative Consequences

AKADEMISK AVHANDLING

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Avhandlingen baseras på följande delarbeten:


Abstract

Prostate Cancer Screening with PSA – A Study of Potential Negative Consequences

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Aims: The Göteborg randomized population-based prostate cancer screening trial is a prospective study evaluating the efficacy of prostate-specific antigen (PSA)-based screening and its effect on prostate cancer mortality. The potential negative consequences in relation to the benefits for men undergoing this screening are explored in this thesis.

Methods: As of December 31, 1994, there were 32,298 men born between Jan 1, 1930 and Dec 31, 1944 (ages 50-64, median 56 years) living in the city of Göteborg. Of these, 20,000 men were randomly allocated in a 1:1 ratio to either a screening group or to a control group. This population constitutes the basis for this thesis. The cumulative incidence of prostate cancer and prostate cancer mortality were calculated and analyses made by intention-to-screen. Anxiety levels were assessed in screen-positive men. Short-term overall mortality after prostate biopsy was studied. Perioperative mortality after radical prostatectomy was evaluated from registry linkage with the follow-up study of the National Prostate Cancer Register (NPCR) 1997-2002. Side-effects from radical prostatectomy were evaluated for men in the screening study who underwent radical prostatectomy at Sahlgrenska University Hospital between 2001-2008.

Results: A PSA-based screening program reduced the relative risk of prostate cancer mortality by 44% over 14 years. Overall, 293 men needed to be invited for screening and 12 to be diagnosed to prevent one prostate cancer death. Attending a screening program for prostate cancer is seldom associated with severe negative psychological distress, even for men with persistently elevated PSA levels. The risk of excess fatal complications after biopsy of the prostate is low. Radical prostatectomy is a procedure with very low perioperative mortality throughout the whole of Sweden. With 14 years of screening, for each prostate cancer death averted, the surgically induced morbidity due to screen-detected prostate cancer will render four men impotent or sexually inactive, and less than one man incontinent.

Conclusions: PSA screening significantly, and substantially, reduces prostate cancer mortality. This benefit compares favorably to other cancer screening programs. The potential negative consequences of such screening may be acceptable in the light of a disease-specific mortality reduction. The risks of severe consequences from the screening procedures and radical prostatectomy seem minor, but the risk of negatively influencing the sexual performance may be substantial. The outcome on a population level may differ from the benefit for the individual.

Keywords: prostate cancer; screening; mortality; early detection; anxiety; 30-day mortality; prostatectomy; Prostate-Specific Antigen; prostate biopsy; impotence; urinary incontinence


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