Re: Prostate Cancer Diagnosis and Treatment After the Introduction of Prostate-Specific Antigen Screening: 1986–2005

Overdiagnosis associated with screening is considered to be the explanation of the growing incidence of a variety of cancer, including prostate (1) and breast cancers (2). On the basis of an analysis of age-specific prostate cancer incidence and treatment data from the National Cancer Institute’s Surveillance, Epidemiology, and End Results program and age-specific population estimates from the US Census, Welch and Albertsen (3) concluded that the introduction of prostate-specific antigen (PSA) screening since 1986 in the United States has resulted in more than 1 million additional men being diagnosed and treated for prostate cancer and that for each man for whom prostate cancer death was averted, approximately 23 men had to be diagnosed and approximately 18 treated.

The study from Welch and Albertsen raises two questions: 1) the actual cause of the presently observed growing incidence of cancer and especially of prostate cancer in all industrialized countries and 2) the value of screening tests for decreasing cancer mortality. Prostate and breast cancers are indeed two models that are often set forth to answer these two questions because of their recent drastic increased incidence—they may represent approximately 30% of overall cancers—and their early detection by the use of PSA and mammography screening, respectively.

A missing point of the article is that to estimate the overdiagnosis impact of screening on prostate cancer incidence, the authors did not analyze the incidence of prostate cancer much before 1986. On the basis of the analysis of several European cancer registries with sufficient follow-up and record quality, incidence of prostate and breast cancers was already increasing before the use of screening tests (4). This is particularly the case in Norway (Figure 1). A break point in the slopes of the incidence curves occurs between 1992 and 1993, which corresponds to when routine mammography and PSA screening became standard practice in this country. Before the introduction of these tests (1953–1993), the number of prostate cancers doubled and that of breast cancers nearly doubled. Other factors should be therefore considered to explain the growing incidence of these cancers. Indeed, endocrine disruption caused by environmental pollutants is a common mechanism of chemical carcinogenesis (5) that might also account for a genuine growing incidence of both these two hormone-dependent cancers. For example, mass production of the xeno-estrogenic polycarbonate plastic molecule bisphenol A has been shown to initiate and promote prostate cancer in laboratory animals, and this may be true in humans (6).

The role of PSA screening in decreasing prostate cancer mortality is still debated; screening using mammography appears to be beneficial for women with breast cancer, with a 24%–48% decreased mortality. Pathological analysis of biopsies of prostate cancers detected by PSA screening revealed a pattern of Gleason scores similar to those of prostate cancers not detected by screening, suggesting that PSA screening can detect cancers associated with poor prognosis (7). We suggest that in addition to overdiagnosis because of screening, the growing incidence of prostate cancer may be associated with a genuine environment-related public health problem, as it may also be the case for breast cancer and nonscreened cancer types. We also propose that PSA screening may be used to select prostate cancers according to their Gleason grading, such that to avoid unnecessary treatment, only cancers detected by screening with high Gleason grades should be treated.

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Figure 1. Incidence rates for prostate (open squares) and breast (solid squares) cancers since 1953–1957 in Norway (adapted from Institute of Population-Based Cancer Research, the Cancer Registry of Norway). Data available at http://www.kreftregisteret.no/en/The-Registries/Cancer-Statistics/.
References


Notes

Welch and Albertsen declined an invitation to respond to this Correspondence.

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