Short Communication

Rapid Rise and Subsequent Decline in Prostate Cancer Incidence Rates for New Mexico, 1989–1993

Frank D. Gilliland, Daniel J. Welsh, Richard M. Hoffman, and Charles R. Key

University of New Mexico School of Medicine, Departments of Medicine, Pathology, and the New Mexico Tumor Registry. Cancer Research and Treatment Center, Albuquerque, NM 87131.

Abstract

Beginning in the late 1980s, a large increase in incidence rates for prostate cancer occurred in association with increased prostate-specific antigen (PSA) screening. In New Mexico, the increased screening was associated with earlier detection of cancers and decreased prostate cancer mortality, suggesting that PSA screening may be effective. PSA screening has become a controversial topic of public debate, and anecdotal reports from physicians indicated that prostate cancer screening practice patterns were changing in New Mexico. To assess whether PSA-associated trends in prostate cancer incidence were continuing, we examined incidence rates from 1989 to 1993 among men in New Mexico.

From 1989 to 1992, age-adjusted rates increased substantially for non-Hispanic whites (77%), Hispanics (50%), and American Indians (27%). Although rates increased for all stages combined, incidence rates decreased for distant-stage disease, especially for non-Hispanic whites, indicating a continuing trend toward earlier detection. In 1993, incidence rates unexpectedly decreased from 203 to 158/100,000 in non-Hispanic whites, largely as a result of changes in rates for men over age 65 years. Although incidence rates decreased, the trend toward earlier detection was maintained for non-Hispanic whites. In contrast, among Hispanics and American Indians, rates did not change substantially between 1992 and 1993. Because the epidemic in prostate cancer was associated with increased PSA screening, it is likely that the trends for non-Hispanic whites are related to PSA screening. We suggest that the decrease in rates and the continued stage shift are consistent with repeated screening of men in the population at risk.

Introduction

Prostate cancer incidence rates for American men increased more than 40% between 1989 and 1991, the most recent years for which data are available (1). The rise was most pronounced in men ages 65 years and older, with reported rate increases exceeding 80% (2). Similar increases in rates have been observed among men in New Mexico (3). Estimates based on the United States trends indicate that more than 244,000 new cases of prostate cancer will be diagnosed in 1995 (4).

The recent epidemic increase in prostate cancer in the United States and in New Mexico during the late 1980s and 1990s was associated with the increased use of PSA screening (2, 3). In New Mexico, a stage migration from distant to earlier stages was associated with a significant decrease in mortality. The trends of increased incidence and decreased mortality with an increase in screening probably reflect changes in medical surveillance and more effective screening techniques (2, 3, 5, 6).

The rapid rise in prostate cancer incidence and PSA screening was widely publicized and resulted in controversies, especially for men ages 70 years and older, when several epidemiological studies suggested that treatment may not significantly increase life expectancy (7–9). The debate was further fueled by the rapid increase in the therapeutic use of radical prostatectomy, an intervention untested by clinical trial and having significant morbidity and mortality, especially in men older than 70 years (9, 10). Anecdotal reports from physicians practicing in New Mexico indicated that the public debate and payer review was affecting prostate cancer screening practice patterns. To assess whether the trends in prostate cancer incidence associated with the increased use of PSA screening continued during the national controversy about PSA screening and during possible changes in medical surveillance, we examined annual age-adjusted, stage- and age-specific incidence rates for non-Hispanic whites, Hispanics, and American Indians residing in New Mexico for the 5-year period from 1989 to 1993.

Subjects and Methods

State trends in prostate cancer incidence were examined for the period 1989–1993 by using data collected by the NMTR, a member of the SEER Program of the National Cancer Institute. NMTR has recorded population-based cancer incidence in New Mexico since 1969 (11). Cancer cases are identified through active surveillance of hospital records, outpatient clinic records, pathology and autopsy reports, and radiation therapy records. Methods used by NMTR have been presented previously (12–14). We used the direct method to calculate age-adjusted rates, using the 1970 United States population as a standard. Confidence intervals were calculated, assuming that rates followed a Poisson distribution (1).

Race and ethnicity of cancer patients ascertained by NMTR were defined by using multiple sources including self-report, medical records, Indian Health Service records, Spanish...
Incidence rates for all stages combined rose and fell over the 5-year period for non-Hispanic whites; however, the pattern of decreasing distant stage rates was maintained, indicating a continuing trend toward earlier detection from 1989 to 1993. Although age-adjusted incidence rates increased from 1989 to 1992, rates for distant-stage disease decreased for non-Hispanic whites. When rates for all stages decreased among non-Hispanic whites in 1993 (Table 1), rates for distant stage (35.1%) decreased more than local stage (19.0%). Consistent with the changes in incidence rates in 1993, the proportion of cases diagnosed at a distant-stage decreased and the proportion at a local stage increased among men in both the under and over 70 years age groups (data not shown). Among Hispanics and American Indians, the changes in age-adjusted rates were smaller and no clear pattern in stage-specific rates emerged.

The rapid rise and fall in incidence rates seen in non-Hispanic whites was different for men less than 70 years of age as compared to those greater than 70 years of age (Fig. 1A). Between 1989 and 1992, incidence rates increased more than 75% in men greater than 70 years of age. Although rates increased in men less than 70 years of age, the change was smaller. The decrease in age-adjusted rates for non-Hispanic whites between 1992 and 1993 reflected large decreases in rates for men 70 years of age and older. For men more than 70 years of age, between 1992 and 1993, the rates dropped to approximately the 1989 levels. In contrast there was little change for men less than 70 years of age. Rates did not change significantly for men older than 85 years. The pattern of decreasing distant stage rates was maintained, indicating a continuing trend toward earlier detection from 1989 to 1993. Although age-adjusted incidence rates increased from 1989 to 1992, rates for distant-stage disease decreased for non-Hispanic whites. When rates for all stages decreased among non-Hispanic whites in 1993 (Table 1), rates for distant stage (35.1%) decreased more than local stage (19.0%). Consistent with the changes in incidence rates in 1993, the proportion of cases diagnosed at a distant-stage decreased and the proportion at a local stage increased among men in both the under and over 70 years age groups (data not shown). Among Hispanics and American Indians, the changes in age-adjusted rates were smaller and no clear pattern in stage-specific rates emerged.

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eluded that the increase was highly correlated with incidental to increase dramatically in 1987, and from 1990 to 1991, prostate for benign prostatic hypentropy. National rates started to increase slowly in areas covered by SEER registries (1). From 1973 through the late 1980s, prostate cancer incidence rates increased about 25% (1). The rapid increase was likely the result of increased detection of prostate cancers by using PSA for screening (2).

Data for 1992 and 1993 in New Mexico indicate that the prostate cancer epidemic may be ebbing as quickly as it developed. The time scale for the rise and fall in prostate cancer incidence rates is unusual for chronic disease such as cancer. Because the increase in rates was likely the result of the increased use of PSA for prostate cancer screening, the rapid changes in rates indicate the potential for changes in medical practice to have large effects on rates, especially for diseases that have a high subclinical prevalence (3). If a similar decrease is occurring nationally, the American Cancer Society’s projection of 244,000 new cases in 1995 may be a substantial overestimate.

Several factors might explain the 22% drop in incidence rates in a 1-year period, the continuing stage migration to earlier stage, and the trends for age-specific rates. Incomplete case ascertainment in 1993 could explain the decrease in rates. Because many transrectal prostate biopsies are now performed in offices and clinics and because specimens are sent to independent pathology laboratories, our data collection system may have missed cases whose biopsies were processed in these laboratories. However, we reviewed specimen referral patterns, case ascertainment, and the data collection process and identified no missed cases. We also found that all pathology facilities where prostate biopsy specimens were sent for histology were visited routinely by NMTR staff and that the decrease in rates occurred in many practices and facilities. Furthermore, the decrease in prostate cancer incidence rates between 1992 and 1993 has been noted in other cancer registries. From these reviews, we conclude that incomplete case ascertainment is unlikely to account for the 22% decrease in rates for 1993.

A decrease in screening is another possible explanation for the fall in incidence rates. Screening may have decreased because the use of PSA for screening has become controversial among both physicians and the community at large (2, 7). This controversy is largely the result of concerns about the detection and treatment of clinically insignificant cancers and the efficacy of treatment (2, 7, 9, 10). The use of radical prostatectomy for curative treatment has increased (3, 10). However, radical prostatectomy has not been shown to be effective and is associated with significant complications and decreased quality of life (23).

Although we do not have direct data on PSA screening, we do have estimates of the number of PSA assays from 1992 and 1993 from three of the four largest clinical laboratories in the Albuquerque metropolitan area. In this sample, the number of PSA assays increased from approximately 8,898 in 1992 to 11,781 in 1993. We estimated the contribution of assays ordered for prostate cancer follow-up by linking PSA data from one medical center with the NMTR database. We found that of 1,509 men who had PSA assays conducted at this medical center in 1993, 61% (4%) had been diagnosed previously with prostate cancer. Because the proportion of men who had PSA assays for cancer follow-up is low, it is unlikely that follow-up tests account for the increase in PSA assays. To further examine trends in prostate cancer screening, we conducted a medical record review of a random sample of prostate cancer cases in New Mexico between 1991 and 1993. We found that 38% of cases diagnosed in 1991 were detected by PSA or DRE. This percentage increased to 42% in 1992 and to 62% in 1993. Thus, it appears that prostate cancer screening may have increased between 1992 and 1993. We have been unable to find any evidence that a decrease in screening has occurred. However, data from the New Mexico Behavioral Risk Factor Survey indicate that less screening among Hispanics may account for the increase in PSA assays. To further examine trends in prostate cancer screening, the majority of men have been screened annually with DRE and PSA for all men over
50 years of age and men 40–50 years of age who are at high risk (24). Introduction of a sensitive screening method would be expected to result in an increase in incidence rates from the diagnosis of prevalent tumors, and a shift to earlier stages at diagnosis. Because the lead time for PSA screening is estimated to be between 4 and 10 years (25), repeated screening on an annual basis is expected to result in a transient increase in rates as prevalent cases are detected, followed by a decline in rates to a level that reflects true incidence rates. Repeat screening is also predicted to result in diagnosis at an earlier stage in the screened population over time (26, 27).

The decrease in rates for non-Hispanic whites from 1992 to 1993, the trends for age-specific rates, and the stage migration to earlier stage of disease at diagnosis suggest that repeat screening may now be occurring in New Mexico. We are in the process of gathering additional information on the trends in PSA screening by developing a prostate cancer screening surveillance system that has a population-based PSA registry, a telephone survey of men eligible for screening, and linkage to the NMTR. Preliminary data from this surveillance system indicates that repeat screening on an annual basis is occurring in the Albuquerque area. Data from 1992 and 1994 show that 33% of men screened with PSA in 1993 had a repeat PSA in 1994. Potoksy et al. (2) estimated that 18% of American men over 65 years underwent PSA screening in 1991. Extrapolating this high yearly screening rate through 1995 suggests that repeat screening may now be occurring nationally. Additional data about PSA screening for 1992 and 1993 will become available when SEER incidence data and Medicare data are linked for the period of study (28).

In New Mexico, prostate cancer incidence rates have declined as rapidly as they rose. The decrease occurred primarily among non-Hispanic whites 65 years and older and was associated with a continuing trend toward earlier diagnosis of tumors. We suggest that the decrease is associated with repeat screening of individuals in the population at risk. Our findings indicate the potential for changes in medical surveillance to affect large and rapid changes in incidence for diseases with high prevalence. Population-based surveillance of PSA screening is needed to determine the role of screening in producing the rapidly changing pattern of prostate cancer rates.

References

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F D Gilliland, D J Welsh, R M Hoffman, et al.

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