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Telephone 503/731-4024
Emergencies 503/731-4030
Fax 503/731-4798
cd.summary@state.or.us
www.oshd.org/cdpe/

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PROSTATE CANCER: TO SCREEN OR NOT TO SCREEN

PROSTATE CANCER is the most common invasive cancer and the second leading cause of deaths due to cancer among Oregon men. In 1999, 2,721 Oregon men were diagnosed with, and 445 men died of, prostate cancer.

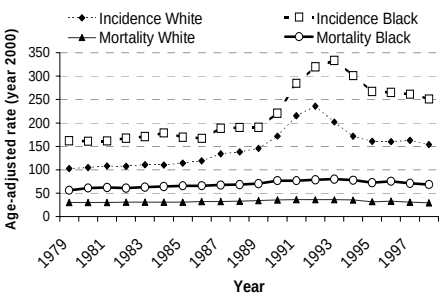
Routine screening for prostate cancer is controversial. Most prostate cancers occur in older men, grow slowly, and do not affect survival. And the side effects of treating these indolent tumors can dramatically diminish a man's quality of life. It is the aggressive, although less common, forms of prostate cancer that are associated with high morbidity and mortality and warrant treatment. Unfortunately, current screening methods cannot reliably distinguish aggressive from slow-growing tumors. In this *CD Summary*, we present data on prostate cancer in Oregon, and discuss current screening methods and the surrounding controversy.

NATIONAL DATA*

Prostate cancer incidence in the U.S. increased steadily over several decades (figure). Then in the late 1980's, the reported incidence increased rapidly after the introduction of the Prostate-Specific Antigen (PSA) test, peaking at 236.1 per 100,000 men in 1992. This peak was likely due to PSA screening detecting latent tumors. The incidence then fell 32% to 161.5 in 1998.

The age-adjusted mortality rate for prostate cancer in the United States slowly increased to a peak of 39.1 per 100,000 in 1993 and then decreased to 31.9 in 1998. The five-year survival for affected men has increased steadily from 64% in men diagnosed in 1973 to 93% in 1990.[1] This improved survival after diagnosis likely reflects men being diagnosed earlier in the natural course of illness (not a real change in survival, but because tumors are detected earlier, men live longer after diagnosis), as well as improved treatment.

National prostate cancer incidence and mortality, 1973–1998



OREGON DATA**

In contrast to the recent decrease in incidence nationally, prostate cancer incidence in Oregon has risen 24% from 143.0 in 1996 to 177.2 in 1999. The apparent upward trend in Oregon likely reflects improved reporting of cases, rather than a true increase in incidence. (The Oregon State Cancer Registry first began collecting data on 1996 diagnoses, and we expect it to take five years or so before reporting stabilizes. More intensified case-finding procedures, including complete death-certificate review, contributed to a 15% increase in cases from 1998 to 1999.) The median age at diagnosis of prostate cancer in Oregon (69 years) remained unchanged between 1996 and 1999; 85% of tumors were diagnosed in men ⩾60 years. During this same period, the prostate cancer mortality rate dropped 16% from 38.5 in 1996 (505 deaths) to 32.5 in 1999 (445 deaths).

RACE DATA

Nationally, in 1998, African-American men had an age-adjusted incidence rate 63% higher than white men (251.2 compared to 154.0). In addition, the 1998 age-adjusted mortality rate for African-American men was over twice the rate for white men (68.7 compared to 29.4). Although relative survival has increased in both African-American and white men from 1968–1993, African-American men had a 15% lower five-year survival than white men.[2]

In Oregon during 1996–1999, African-American men had an age-adjusted incidence rate 25% higher than the white rate (185.1 compared to 148.1), and a mortality rate (70.4) twice that of white men (35.0). The median age at diagnosis for African-American men in Oregon was 64, five years earlier than for white men.

STAGE AT DIAGNOSIS

Nationally, there has been a shift towards detection of earlier-stage tumors, since the introduction of PSA screening.[2] In Oregon, prostate cancers diagnosed in the localized stage increased from 69.5% in 1996 to 74% in 1999; those diagnosed with distant metastases decreased from 5.5% in 1996 to 3.7% in 1999.

SCREENING METHODS

The precise etiology of prostate cancer remains unknown, and the only established risk factors are age, sex, race, and family history. Efforts to lessen morbidity and mortality associated with prostate cancer have focused primarily on screening and early treatment. Therein lies the controversy.

Routine population-based screening is most effective when a disease is serious, the prevalence of asymptomatic disease in the population is high, the diagnostic test is accurate, and the treatment of asymptomatic persons reduces morbidity and mortality more than if given after symptoms develop. Prostate cancer is a serious disease with a high prevalence of asymptomatic disease. However, the sensitivity and specificity of available screening tests are variable, and treatment is not uniformly effective and is associated with significant complications.

Two screening methods are commonly used to detect prostate cancer.[3] The digital rectal examination (DRE) is the oldest screening test, but has low sensitivity (an estimated 25–30% of tumors are located in non-palpable regions of the prostate)

* National incidence data from the Surveillance, Epidemiology and End Results (SEER) Cancer Incidence Public-Use Database, 1973–1998, Department of Health and Human Services, Public Health Service, National Cancer Institute. National mortality data available through CDC Wonder at *http://wonder.cdc.gov*.

** Oregon incidence and mortality data were from the Oregon State Cancer Registry.

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and specificity (a large proportion of results are falsely positive).

The prostate-specific antigen (PSA) test was first introduced in 1986. The sensitivity of the PSA depends on the screening protocol used. Serum levels ⩾4 ng/dL have a reported sensitivity of over 80% in symptomatic men. However, 20% of prostate cancers may be associated with normal serum PSA levels. The specificity is also low, with benign prostatic hyperplasia and prostatitis also causing elevated PSA levels.

Variations of the PSA test, including age-specific reference ranges, measuring %-free PSA, PSA velocity and PSA density have not ben shown to significantly improve sensitivity and specificity. Most importantly, these screening tests cannot reliably distinguish between indolent and aggressive cancers.[3]

TREATMENT OPTIONS

Several options are available to treat prostate cancer: radical prostatectomy; radiation therapy; hormonal therapy; chemotherapy; and watchful waiting. The table shows 10-year survival rates by treatment approach and grade of tumor.[4]

Each of these has advantages and disadvantages. While treatment may improve survival for men with grade III tumors, these account for only 12% of tumors diagnosed in Oregon men. Treatment results are more modest for grade II tumors, and equivocal for grade I tumors. Complications of radical prostatectomy include impotence, incontinence and urethral stricture. Radiation therapy may cause these as well as acute and chronic gastrointestinal symptoms.

WHAT IS A DOCTOR TO DO?

A few men may benefit from diagnosis and aggressive treatment of their prostate cancers. However, screening all men will detect a larger number of tumors that would best be ignored and will falsely label many healthy men as having a potentially fatal disease—leading to anxiety, unnecessary medical workups, and the considerable complications of unnecessary treatments. Are these costs outweighed by the benefits?

At this point, the answer is unclear. The U.S. Preventive Services Task Force states: "Routine screening for prostate cancer with DRE, serum tumor markers (PSA), or TRUS (trans-urethral ultrasound) is NOT recommended." (The Task Force is currently in the process of updating its recommendations—we'll let you know if this changes.) This recommendation is echoed by the American College of Physicians, the American College of Preventive Medicine, and the Canadian Task Force on Preventive Health Care. However, the American Cancer Society and the American Urological Association both recommend routine screening for men ⩾50 years with a life expectancy of ⩾10 years. Two large clinical trials are currently underway that examine early detection and treatment of men with prostate cancer and may help to enlighten the debate. The results of these trials are expected beginning in 2006. One thing all these organizations agree on is that each patient should be advised of the benefits and harms of early detection and treatment, so that he can make well-informed decisions, based on his individual values.

10-year prostate cancer survival by tumor grade and treatment approach

Grade	Prostatectomy	Radiotherapy	Watchful waiting	% Cancers in OR Men*
I	94% (91–95)	90% (87–92)	93% (91–94)	10%
II	87% (85–89)	76% (72–79)	77% (74–80)	74%
III	67% (62–71)	53% (47–58)	45% (40–51)	12%

* grade at time of diagnosis

RESOURCES

- The Association of State and Territorial Chronic Disease Program Directors, *Prostate Cancer Screening: A Matter of Routine or Patient Choice?* 2001. (Excellent brochure available online at: *www. chronicdisease.org/prostatebooklet.pdf*).
- American Cancer Society (*http://www3.cancer.org/cancerinfo/*).
- American Foundation for Urologic Disease (*www.afud.org*).
- Centers for Disease Control and Prevention (www.cdc.gov/cancer/prostate). National Cancer Institute *(http://cancernet.nci.nih.gov/index.html* and *http://www.scld-nci.net*).

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