CHANGES IN RADICAL PROSTATECTOMY AND RADIATION THERAPY RATES FOR AFRICAN AMERICANS AND WHITES

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There are racial differences in prostate cancer outcomes. One variable influencing end results is treatment for cure: either radical prostatectomy (RP) or radiation therapy (RT). The purpose of this report is to determine changes in diagnosis rates of localized prostate cancer between the years before prostate-specific antigen (PSA) use (1973–1988) and the years after PSA use (1989–1996), to evaluate differences in RP and RT rates between the pre-PSA and post-PSA eras, to assess differences in RP and RT rates between African Americans and whites between these intervals. The Surveillance, Epidemiology, and End Results (SEER) data were used and evaluated. Both African Americans and whites had statistically increased rates of localized prostate cancer diagnosed (70.4 and 49.0 in 1973 through 1988 and 123.1 and 84.9 in 1989 through 1996, respectively [$p < 0.05$]). The differences between the pre-PSA and post-PSA eras for African Americans and whites for RP (3.6 vs. 44.3 and 5.0 vs. 44.9, respectively) and RT (23.6 vs. 61.6 and 17.0 vs. 38.1, respectively) were all significant ($p < 0.05$). Both African Americans and whites had increased rates of RP from 3.6 and 5.0 to 44.3 and 44.9, respectively, and RT from 23.6 and 17.0 to 61.6 and 38.1 during the pre- and post-PSA years. (*J Natl Med Assoc.* 2000;92:281–284.)

Key words: prostatectomy ♦ prostate cancer ♦ ethnicity ♦ radiation therapy

Prostate cancer impacts African-American men more adversely than it does white American men. Both incidence and mortality rates have been higher for the former group than for the latter.[1,2] Mortality rates are complex determinations and vary for a variety of reasons, one of which is the accessibility of curative therapy. All other things being equal, a group not offered curative therapy will have a higher mortality rate than a group treated for cure. The objectives of this report were: 1) to examine the impact of prostate-specific antigen (PSA) on the diagnosis of localized disease in these two groups of patients; 2) to assess the impact of PSA on the rates of radical prostatectomy (RP) and radiation therapy (RT) in African-American and white men; and 3) to determine if African-American men with prostate cancer were treated for cure at rates similar to white men.

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Table 1. Effect of PSA on the Diagnosis of Localized Prostate Cancer on African Americans and Whites

Years	African Americans	Rate	Whites	Rate	Total patients
1973–1988	6,769	70.4*	62,639	49.0*	69,408
1989–1996	7,092	123.1*	64,157	84.9*	71,249
Total	13,861		126,796		140,657

*$p < 0.05$

MATERIALS AND METHODS

Incidence rates were calculated from population-based data collected by the Surveillance, Epidemiology, and End Results (SEER) program. All rates were computed per 100,000 persons and were age-adjusted using the direct method to the 1970 U.S. population standard. For this study, prostate cancer cases were limited to African Americans and whites diagnosed from 1973 through 1996 and living in the nine SEER geographic areas. Cumulative incidence rates were calculated for 1973 through 1988 (the pre-PSA era) and 1989 through 1996 (the post-PSA era). Descriptive statistics were computed employing SPSS 8.0 statistical program software (Chicago, IL). The association between variables was analyzed by cross tabulation and chi-square analysis. p values less than 0.05 were considered statistically significant.

RESULTS

There were 69,408 patients diagnosed with localized (T_1 to T_2) prostate cancer for the pre-PSA years and 71,249 diagnosed in the post-PSA years (Table 1). There were 7075 RP- and 24,663 RT-treated patients from 1973 through 1988, and 36,818 RP- and 34,431 RT-treated patients from 1989 through 1996 (Table 2). During the years 1973 through 1988 there were 6769 African Americans diagnosed with localized prostate cancer for an incidence rate of 70.4 and 62,639 whites for a rate of 49.0 (Table 1). Of the African Americans, 397 had underwent RP for a rate of 3.6 and 2435 had RT for a rate of 23.6. Of the whites, 6678 had underwent RP for a rate of 5.0 and 22,228 had RT for a rate of 17.0 (Table 2).

During the years 1989 through 1996 there were 7092 African Americans diagnosed with localized prostate cancer for a rate of 123.1 and 64,157 whites for a rate of 84.9 (Table 1). Of the African Americans, 3011 had underwent RP for a rate of 44.3 and 4081 had RT for a rate of 61.6. Of the whites, 33,807 had underwent RP for a rate of 44.9 and 30,350 had RT for a rate of 38.1 (Table 2).

There were significant ($p < 0.05$) increases in the rates of localized prostate cancers diagnosed for both African Americans and whites between the pre-PSA and post-PSA years (Table 1). There were significant ($p < 0.05$) increases for RP and RT for African Americans and whites between the eras 1973 through 1988 and 1989 through 1996 ($p < 0.05$) (Table 2). The differences for RP between African Americans and whites in each time period were not significant. The differences for RT between African Americans and whites for the 1973 through 1988 time period were not significant, whereas the differences for the 1989 through 1996 time period were significant ($p < 0.05$).

DISCUSSION

There are racial differences in both incidences and outcomes of various cancers.[3] This is the case for several human cancers, including uterine and prostate. African Americans have had significantly higher incidence and mortality rates.[1,2] Although the exact cause of prostate cancer is not known, its biological aggressiveness is felt by some to be more pronounced in African Americans.[4] However, others, including Roach et al. in a review of 1557 cases,[5] find no racial survival differences. At diagnosis both PSA levels and Gleason scores are higher in African Americans than those in white patients.[6]

The National Cancer Institute's SEER program is a population-based registry that began in 1973. It covers approximately 10% of the U.S. population residing in nine geographical areas. Comparison of SEER and the National Cancer Data Base (NCDB) statistics supports the validity of the former.

The PSA test has dramatically changed the natu-

Table 2. Curative Therapy for Localized Prostate Cancer in African Americans and Whites: Pre- and Post-PSA

Years	Race	Total No. PTS	No. patients with radical prostatectomy	Rate of radical prostatectomy	No. patients with radiation therapy	Rate of radiation therapy
1973–1988	African American	6,769	397	→3.6	2435	→23.6
				↑		↑
				ns		ns
				↓		↓
	White	62,639	6678	5.0←	22,228	17.0←
Total		69,408	7075	$p < 0.05$	24,663	$p < 0.05$
				$p < 0.05$		$p < 0.05$
1989–1996	African American	7092	3011	→44.3	4081	→61.6
				↑		↑
				ns		$p < 0.05$
				↓		↓
	White	64,157	33,807	44.9←	30,350	38.1←
Total		71,249	36,818		34,431	

Significance of pre-PSA and post-PSA years denoted by significance between black and white men denoted by → and ←. Significance between black and white men denoted by ↑ and ↓.

ral history of prostate cancer. There has been a significant stage migration at the time of diagnosis from distant to local disease between the years 1988 through 1991.[4] The data in this report, up to 1996, indicate that for African Americans and whites the proportion of localized disease has increased significantly.

Type of therapy, if any, as well as stage at diagnosis impacts survival rates. Neither RP nor RT has been demonstrated to be superior. Moreover, it appears that the recent drop in prostate cancer mortality rates could, in part, be the result of aggressive therapy for cure: RP and RT. This report notes that both RP and RT rates have significantly increased in the post-PSA era.

African Americans have had higher mortality rates than whites. This is due to a variety of causes:

1. Biologically more aggressive tumors.
2 Diagnosis at a higher stage.
3. Lack of health care access.
4. Cultural influences.
5. Less aggressive therapy. This latter cause is changing (Table 3).

Schapira et al.[7] in 1995, citing SEER data from 1988 and 1989 noted that African Americans were less likely to receive aggressive therapy. Harlan et al.[8] observed that African Americans were receiving curative RP but not at the same rates as whites. Data from Mettlin et al.[9] (using NCDB statistics) and Imperato et al.[10] reflect these findings. Mettlin and Murphy[11], using more recent information, suggested that the RP gap was closing. Klabunde et al.[12] (using SEER 1986 through 1993 data) and Fowler and Bigler[6] (using data from the University of Mississippi) confirmed those findings. Guinan, using more current (1989 through 1996) SEER data, observed that African Americans are now being treated with RT at rates exceeding whites and RP at rates not statistically different than whites. In summary, it appears that African Americans are receiving therapy for cure at rates comparable to whites.

It should be noted that SEER data are provided as rates (corrected to reflect incidence per 100,000 individuals). These data could be expressed as the percentage of individuals receiving a particular therapy, in which case the differences might vary. The data in this report are presented as rates.

It takes several years before mortality rates will decrease to reflect effective therapy for cure. The current decrease in mortality from prostate cancer is probably a result, in part, of the curative effects of RP and RT in both African Americans and whites. It will take several years for these curative efforts to be fully reflected in improved survivals for men with prostate cancer.

Table 3. Therapy for Cure of Localized Prostate Cancer: African-American vs. White Patients

Author (ref)	Year	Database	Years studied	Conclusions
Schapira et al.[7]	1995	SEER	1988–1989	African Americans less likely to receive aggressive therapy
Harlan et al.[8]	1995	SEER	1984–1991	RP percent in African Americans gaining RT in African Americans have caught up
Mettlin et al.[9]	1995	NCDB	1986, 1987, 1992	African Americans had fewer prostatectomies (21.4% vs. 30.1%) African Americans had less radiation (27.1% vs. 31.6%)
Imperato et al.[10]	1996	NY Medicare data	1991–1993	African Americans had lower RP rate than whites
Mettlin et al.[11]	1997	NCDB	1992–1994	RP 29% for whites RP 22% for African Americans RT essentially equal
Klabunde et al.[12]	1998	SEER	1986–1993	African Americans had lower RP rates than whites African Americans had same RT rates as whites
Fowler and Bigler[6]	1998	University of Mississippi	1982–1997	RP lower percentage in African Americans RT equal
Guinan (present series)	1999	SEER	1989–1996	RP rates not statistically different African Americans RT rates higher

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