Quality of Preventive Care Before and After Prostate Cancer Diagnosis

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Abstract

Objective: To examine whether general preventive services were diminished in a cohort of men after their diagnosis of prostate cancer.

Method: A total of 16,604 men enrolled in Kaiser Permanente Southern California who were newly diagnosed with prostate cancer from January 1, 2002, through December 31, 2009, were passively followed through EMRs to determine the use of preventive services, including screening for colorectal cancer (colonoscopy and/or fecal occult blood tests [FOBT]), tests for diabetes (glucose and hemoglobin A1c), heart disease (serum cholesterol, high-density lipoprotein [HDL], and triglycerides), and vaccinations (influenza and pneumococcal). Preventive service use was compared in the 2 years prior to and following prostate cancer diagnosis, using matched odds ratios (MORs) and 95% confidence intervals (CIs) in 2013.

Results: Men were more likely to receive a flu vaccine (MOR 2.70, 95% CI 2.52–2.90), lipid tests (MOR 1.51, 95% CI 1.42–1.61), diabetes tests (MOR 2.13, 95% CI 2.00–2.26), and screening for colorectal cancer (MOR 1.80, 95% CI 1.71–1.89) in the 2 years after prostate cancer diagnosis, compared to before diagnosis. Men with advanced disease at diagnosis were more likely to receive all types of preventive services after diagnosis, compared to men with localized disease.

Conclusion: Once diagnosed with prostate cancer in this setting, no less attention was paid to general preventive care, although there remains room for improvement in pneumococcal vaccination and colon cancer screening rates. The delivery of high-quality continuing care after diagnosis is critical for aging cancer patients.

Keywords: men, depression and miscarriage

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Introduction

As a result of developments in the early detection, treatment, and care related to cancer, the number of people surviving and living with cancer as a chronic illness has rapidly increased in recent years. Currently, there are more than 13.7 million cancer survivors in the United States, and it is estimated that the number of survivors will exceed 18 million by 2022.[1,2] Due to the growing incidence among the aging population, most cancer survivors are now aged over 65 years.[3] Thus, they are at increased risk for developing other comorbid diseases of aging, such as heart disease, type 2 diabetes, and secondary cancers.[3]

Prostate cancer, the most common non-cutaneous cancer among men, now accounts for the largest proportion of male cancer survivors and second largest proportion of cancer survivors overall.[3] With a 5-year survival rate approaching 100%,[4] prostate cancer is a largely survivable chronic condition for most men. The advanced age and prolonged survival of men diagnosed with prostate cancer suggests that many have, or are at increased risk of developing, other comorbid diseases of aging. This makes the delivery of appropriate preventive services to prostate cancer survivors particularly critical[5,6] to preventing the onset and progression of these comorbid conditions.

Given the potentially protracted treatment courses and prolonged recoveries, prostate cancer care is often focused on managing the effects of treatment and preventing recurrence. This could be at the expense of delivering appropriate preventive care for other diseases of aging. While the United States Preventive Service Task Force (USPSTF) recommends that older men receive various screening and preventive services,[7] it is possible the complex delivery of prostate cancer care and the potentially inadequate transition between care phases may result in less preventive care being delivered. In addition, although it remains largely unknown what impact the delivery of preventive care has on overall mortality among prostate cancer survivors, it is plausible that increasing the quality of preventive care in the survivorship period would decrease the risk of death due to causes other than cancer.

Out of this concern and to advance our understanding regarding the preventive care of prostate cancer survivors, the goal of this study was to compare preventative health service use for other comorbid diseases of aging before and after prostate cancer diagnosis in a multi-ethnic population of men diagnosed with prostate cancer in Kaiser Permanente Southern California (KPSC).

Methods

Study Population

KPSC is an integrated health care system that provides comprehensive health services for approximately 3.7 million residents of Southern California via 14 hospitals, 209 medical offices, and more than 6,000 physicians. Members enroll through the Kaiser Foundation Health Plan for prepaid health care insurance, including pharmaceutical benefits. The population served by KPSC is socio-economically diverse and broadly representative of the racial/ethnic groups living in Southern California.[8] Health care access barriers are minimized due to universal insurance coverage. Information regarding diagnoses, treatments, and use of various health services is available through extensive electronic medical records (EMRs).

The source population for this study was the 1.6 million male health plan members in KPSC. Men were eligible for inclusion if they were diagnosed with prostate cancer between 2002 and 2009 (n = 19,970). To capture preventive service use before and after diagnosis, we excluded men who were not health plan members for at least 1 year prior to and following their prostate cancer diagnosis (n = 3,323). We also excluded men who had a prostate cancer diagnosis prior to baseline (n = 4), and those who had previously undergone a radical prostatectomy (n = 39). The remaining 16,604 men (83.1%) were included in this analysis. The Kaiser Permanente Internal Review Board reviewed and approved this study, and the data were analyzed in 2013.

Prostate Cancer Diagnosis

We defined prostate cancer survivors as men diagnosed with any stage of biopsy-confirmed prostate cancer from 2002 through 2009. Men with prostate cancer are identified through the KPSC cancer registry, which reports to the Surveillance Epidemiology and End Results (SEER) registry. The registry data are 99% complete for both inpatient and outpatient admissions for the diagnosis of new and prevalent cancers.[9] Cancer stage is based on the SEER staging system[10] and Gleason score grade.[11]

Preventive Services

We identified use of preventive and health-maintenance services as recommended by the USPSTF for men, 2 years pre- and post-prostate cancer diagnosis, using electronic health plan files. We included the use of adult preventive services for heart and vascular disease (total cholesterol, triglyceride, and high-density lipoprotein measurement), colorectal cancer screening (fecal occult blood tests [FOBT], and/or sigmoidoscopy or colonoscopy), diabetes (glucose testing and hemoglobin A1C measurement), pneumonia (vaccination), and influenza (seasonal vaccination). Because prostate-specific antigen screening is often ordered as part of a preventive service panel, we excluded from the analysis the use of services 90 days before and after prostate cancer diagnosis, to avoid inflating the use of services at the time of diagnosis.

Covariate Assessment

We abstracted age at prostate cancer diagnosis, race (non-Hispanic White, Black, Hispanic, Asian, and Other), membership length, and marital status from the EMRs. We collected medical histories, including previous diagnosis of comorbid conditions such as cardiovascular disease (including hypertension), diabetes, hyperlipidemia, and other cancers, via electronic health plan files. We measured the presence of comorbidities with the Charlson index.[12] We collected prostate cancer characteristics, including cancer stage at diagnosis, grade, Gleason score, and primary treatment within six months of diagnosis (surgery, radiation, hormone, or none/other) from the cancer registry files.

Statistical Analysis

We determined the use of preventive services 2 years prior to and following prostate cancer diagnosis (2002–2009) and compared them, using conditional logistic regression and used matched odds ratios (ORs) and 95% confidence intervals (CIs) to estimate the odds of preventive service use after prostate cancer diagnosis, compared to pre-diagnosis. We then stratified the use of preventive services before and after prostate cancer diagnosis by race/ethnicity, prostate cancer stage at diagnosis, prostate cancer diagnosis date, and age to assess potential effect modification. All analyses used an alpha level of 0.05 to determine statistical significance and were performed with SAS 9.2 (Cary, NC).

Results

Of the 16,604 men included in this study, mean age at diagnosis was 65 years. The study population was diverse: 54.9% were Caucasian, 18.6% were Hispanic, 16.7% were African American, and 2.4% were Asian. Approximately 46% of men attained an education level of college or higher. Most had localized prostate cancer at diagnosis (83.5%) that was well or moderately differentiated (60.4%) (Table 1).

In comparing preventive services use before and after diagnosis (Table 2), men were more likely to receive a flu vaccine (MOR 2.70, 95% CI 2.52–2.90), a lipid panel test (MOR 1.51, 95% CI 1.42–1.61), and a screening or maintenance test for diabetes (MOR 2.13, 95% CI 2.00–2.26) in the 2 years after prostate cancer diagnosis, compared to the 2 years before diagnosis. Men were also more likely to be screened for colorectal cancer in the 2 years after prostate cancer diagnosis, compared to the 2 years before (MOR 1.80, 95% CI 1.71–1.89). However, men were similarly as likely to receive a pneumococcal vaccination after diagnosis, when compared to before (MOR 1.10, 95% CI 1.04–1.17).

When these results were stratified by race/ethnicity (Table 3), the trend of men being more likely to receive flu vaccine, lipid panel, diabetes testing, and colorectal (CRC) screening after diagnosis persisted across all racial/ethnic categories, with little variation (results not shown). In addition, we saw very little variation in preventive service use when results were stratified by age at prostate cancer diagnosis (results not shown).

When stratified by prostate cancer stage at diagnosis, the increased use of services after diagnosis, compared to before, was more pronounced among those with advanced prostate cancer (stage III/IV), compared to those with localized disease (stage I/II) for all types of clinical preventive services. The proportion of men who received the flu vaccine after diagnosis, compared to before, increased 14% if they were diagnosed with advanced disease (MOR 3.17, 95% CI 2.67–3.76), compared to a 10% increase among men who had localized disease at diagnosis (2.61, 95% CI 2.41–2.82). The increased use of diabetes tests after diagnosis was also strongest among those with advanced disease at diagnosis, with a 16.3% increase after diagnosis, compared to an 8.8% increase in men with localized disease.

When stratified by year of prostate cancer diagnosis (Table 4), CRC screening was more common after diagnosis, compared to before, but this increase in use was greatest in the later time periods (2006 through 2009). FOBT/FIT testing after diagnosis alone increased from 5.6% in 2002–2003 to 36.8% in 2008–2009. We also assessed the use of the other preventive services stratified by prostate cancer diagnosis date and found a consistent increase of service use after prostate diagnosis, compared to before, regardless of when prostate cancer was diagnosed (results not shown).

Table 5 displays the mean number of visits by provider type in the 2 years before and after diagnosis. Overall, the mean number of ambulatory visits doubled after diagnosis, with 30.3 visits in the 2 years following diagnosis, compared to an average of 15.7 visits in the two years before. The mean number of visits to urology/oncology increased from 1.0 visit in the 2 years prior to diagnosis to 5.1 visits in the 2 years after diagnosis. Also, the mean number of visits to primary care (family and/or internal medicine) increased slightly, from 5.6 visits in the 2 years before diagnosis, compared to 6.7 visits in the 2 years after diagnosis.

Discussion

These data suggest that subsequent to a diagnosis of prostate cancer, men experience greater levels of preventive services in this setting, counter to our working hypothesis that they would decrease after diagnosis. In addition, very little variation in the increased use of services after diagnosis was seen across race/ethnicity, age at diagnosis, or year of diagnosis. However, the increased use of services after diagnosis was most pronounced among men with advanced prostate cancer at diagnosis.

Previous studies suggest that prostate cancer survivors receive comparable preventive care to disease-free control subjects after diagnosis,[13–16] but few have compared use of services before and after diagnosis. Snyder and colleagues found an increase in use of flu vaccines and a slight decrease in the use of CRC screening among prostate cancer survivors, compared to control subjects.[15] Khan and colleagues found that men with prostate cancer were equally as likely to receive flu vaccines and cholesterol tests after diagnosis, compared to cancer-free control subjects.[17] Our findings are similar, as flu vaccines, cholesterol, and diabetic tests were consistently used both before and after prostate cancer diagnosis in this cohort, suggesting that no less attention is being paid to the delivery of these services after diagnosis. It is possible that the high use of services in this cohort is related to an increase in physician visits once diagnosed, as shown in studies by Snyder et al that focused on colorectal and breast cancer patients.[18–21]

The proportion of men with prostate cancer in this study who used preventive services is higher than those previously reported in other survivor populations.[13,15,19] More than 80% of men had a lipid test, approximately 75% had a diabetes test, and 65% had a flu vaccine in the 2 years before or after prostate cancer diagnosis. Snyder and colleagues found rates of preventive services to be lower in the first year following diagnosis of prostate cancer in SEER-Medicare, with 48% of men receiving a flu vaccine, 28% receiving cholesterol testing, and 29% receiving colorectal cancer screening.[15] Our increased rates of use may be due, in part, to the equal access afforded by this insured population. Results from Yabroff and colleagues suggest access to care plays an important role in the use of services among survivors; use of preventive services was greatest among insured cancer survivors and lowest among uninsured survivors.[22] This might also be a reflection of the greater number of clinic visits following prostate cancer diagnosis, thus creating more opportunities for men to receive these services. This study was done in a managed care organization that employs an integrated care model, which promotes the use of preventive care, regardless of provider specialty. For example, a proactive office encounter tool embedded in the EMR that prompts the physician (regardless of specialty) to order appropriate preventive services was implemented system-wide in 2007. Services evaluated in this study, such as the vaccinations and colorectal cancer screenings, are addressed by this tool; as a result, it is possible this system-level intervention may result in higher rates of use when compared to other populations, potentially creating ceiling effects.

When stratified by clinical stage at diagnosis, our results suggest the use of preventive services is greater among men diagnosed with advanced stage disease. This counters our working hypothesis that use of services would be diminished after diagnosis, particularly among men with advanced disease in whom treatment and palliative care are prioritized. It is possible this increase in use among men with advanced disease and limited life expectancy may partly be due to a greater

number of office visits and, therefore, more opportunities to receive these services, compared to men with localized disease. It might also represent increased attention due to a greater perceived vulnerability.

Men in this study were more likely to receive screening for CRC after prostate cancer diagnosis, compared to before, and the use of CRC screening both before and after diagnosis increased over time. This is likely the result of a colorectal cancer screening outreach program, which was rolled out in 2006–2007 to improve the use of FOBT/FIT. Our results closely track the implementation of this program, as the rates of FOBT/FIT use in this sample increased 30% in the years after the program was implemented. This increase in CRC use supports the notion that system-level interventions may be useful when trying to improve the quality of preventive care among cancer survivors.

Although this study assessed preventive care service use both before and after prostate cancer diagnosis in a large, diverse cohort of men with prostate cancer of all ages in equal-access, general practice settings, there are several potential limitations to consider. This analysis did not account for previous use of preventive services and thus did not take into account whether men were due to receive these services. As a result, men might not have been due to receive the services in the time period studied. A proportion of the services performed in this study might have been done for the diagnosis or maintenance of already existing comorbidities. However, when we assessed the use of these services among men with a diagnosis of heart disease or diabetes only, the results were similar to those presented in this analysis. Also, because some of these services are recommended in longer time intervals than 2 years, the rates reported might underestimate true use of these services. The 2-year period after diagnosis also limits the conclusions that can be made regarding the delivery of preventive care after men transition to the continuing care phase after treatment. While we employed a case-crossover design to further our understanding specifically about what happens with the use of preventive services around the time of prostate cancer diagnosis, and to limit the potential for confounding, this design does not allow for the comparison of service use to cancer-free control subjects, which is the focus of a future analysis. System-level factors specific to this managed care organization also influenced the use of preventive services and resulted in higher rates of use, which might limit the generalizability of these findings to other populations in which these interventions are not employed. However, our results would support the notion that system interventions play an important role in promoting the use of preventive services following cancer diagnosis.

Table 1. Demographics and Clinical Characteristics (*n* =16,604)

Demographics	*n* (%)
Age at baseline in years, mean (SD)	65.4 (9.5)
<40	6 (0.1)
40–49	773 (4.7)
50–59	3956 (23.8)
60–69	6532 (39.3)
70–79	4152 (25.0)
80+	1185 (7.1)
Race	
Non-Hispanic White	9123(54.9)
African American	2778(16.7)
Hispanic	3089(18.6)
Asian	396(2.4)
Other/Unknown	1218(7.3)
Marital Status	
Divorce/separated/widowed	2235(13.5)
Married or live with partner	11713(70.5)
Never married	1337(8.1)
Other/unknown	1315 (7.9)
Prostate Cancer Characteristics	***n* (%)**
Year of Diagnosis	
2002–2005	7836(47.2)
2006–2008	8768(52.8)
Stage	
Localized	13756(83.5)
Advanced	2726(16.5)
Grade	
Well/moderately differentiated	9745(60.4)
Poorly differentiated	6392(39.6)

Table 2. Preventive Service Use 2 Years Before and After Prostate Cancer Diagnosis

Clinical Preventive Services*	2 years before diagnosis *n* (%)	2 years after diagnosis n (%)	MOR (95% CI)
Immunizations			
Influenza	8974 (54%)	10736 (64.7%)	2.70 (2.52–2.90)
Pneumococcal	2098 (12.6%)	2313 (13.9%)	1.10 (1.04–1.17)
Heart Disease			
Any lipid test	12682 (76.4%)	13495 (81.3%)	1.51 (1.42–1.61)
Diabetes			
Hemoglobin A1c or fasting glucose	12324 (74.2%)	13988 (84.2%)	2.13 (2.00–2.26)
Colorectal Cancer			
Any colorectal screening	4311 (26%)	6297 (37.9%)	1.80 (1.71–1.89)

*Services received 3 months before or after prostate cancer diagnosis were excluded.

Table 3: Preventive service use 2 years before and after prostate cancer diagnosis: Stratified by stage at diagnosis*

Stage at prostate cancer diagnosis	Localized Disease (I/II)	Advanced Disease (III/IV)
Influenza vaccine		
2 years prior	7588 (55.2%)	1321 (48.5%)
2 years after	8964 (65.2%)	1692 (62.1%)
MOR (95% CI	*2.61 (2.41- 2.82)*	*3.17 (2.67- 3.76)*
Pneumococcal vaccine		
2 years prior	1758 (12.8%)	312 (11.4%)
2 years after	1927 (14%)	372 (13.6%)
MOR (95% CI	*1.10 (1.03- 1.17)*	*1.19 (1.03- 1.39)*
Heart Disease (Lipid panel)		
2 years prior	10718 (77.9%)	1880 (69%)
2 years after	11282 (82%)	2119 (77.7%)
MOR (95% CI	*1.43 (1.33- 1.53)*	*1.90 (1.63- 2.20)*
Diabetes (HbA1c and/or fasting glucose)		
2 years prior	10389 (75.5%)	1846 (67.7%)
2 years after	11590 (84.3%)	2289 (84%)
MOR (95% CI	*1.95 (1.82- 2.09)*	*3.15 (2.69- 3.69)*
Any CRC screening		
2 years prior	3656 (26.6%)	633 (23.2%)
2 years after	5276 (38.4%)	983 (36.1%)
MOR (95% CI	*1.77 (1.68- 1.87)*	*1.96 (1.73- 2.23)*

*Services received 3 months before or after prostate cancer diagnosis were excluded.

Table 4: Colorectal cancer screening 2 years before and after prostate cancer diagnosis: Stratified by year of prostate cancer diagnosis*

Year of Prostate Cancer Diagnosis	2002-2003	2004-2005	2006-2007	2008-2009
Any CRC screening				
2 years prior	649 (16.4%)	611 (15.8%)	1009 (23%)	2042 (46.6%)
2 years after	802 (20.3%)	1190 (30.7%)	2150 (49.1%)	2155 (49.1%)
MOR (95% CI)	*1.31 (1.16- 1.47)*	*2.35 (2.10- 2.63)*	*3.01 (2.73- 3.30)*	*1.11 (1.02- 1.21)*
FOBT/FIT				
2 years prior	213 (5.4%)	177 (4.6%)	516 (11.8%)	1566 (35.7%)
2 years after	220 (5.6%)	555 (14.3%)	1621 (37%)	1612 (36.8%)
Colonoscopy/Sigmoidoscopy				
2 years prior	472 (11.9%)	465 (12%)	595 (13.6%)	791 (18%)
2 years after	636 (16.1%)	758 (19.5%)	948 (21.6%)	933 (21.3%)

*Services received 3 months before or after prostate cancer diagnosis were excluded

Table 5: Mean number of visits 2 years before and after prostate cancer diagnosis by provider specialty or location

	Utilization 2 years before prostate cancer diagnosis	**Utilization 2 years after prostate cancer diagnosis**
	2 years before	2 years after
Department	Mean (SD)	Mean (SD)
Ambulatory	15.7 (17.33)	30.3 (24.55)
Family/Internal	5.6 (5.84)	6.7 (6.96)
Urology/Oncology	1.0 (2.62)	5.1 (6.00)
Inpatient	0.2 (0.65)	0.6 (1.06)
Other (home health, hospice, etc.)	0.1 (1.20)	0.5 (2.47)
Emergency Dept.	0.6 (1.36)	0.8 (1.69)

Conclusion

Our results suggest that, in this system, men received no less preventive care after prostate cancer diagnosis, compared to before. In fact, we observed increased in the use of most preventive services following diagnosis, although there remains room for improvement. As more men with prostate cancer die from causes other than cancer, identifying ways to promote the delivery of appropriate services for preventable diseases of aging is critical.

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References

1. American Cancer Society. Cancer Treatment and Survivorship Facts and Figures 2012–2013. Atlanta: American Cancer Society; 2012.
2. Mariotto AB, Yabroff KR, Shao Y, et al. Projections of the cost of cancer care in the United States: 2010–2020. J Natl Cancer Inst 2011;103:117–28.
3. Altekruse SF KC, Krapcho M, Neyman N, et al., eds. . SEER Cancer Statistics Review, 1975–2007. Bethesda (MD): National Cancer Institute; 2010.
4. American Cancer Society. Survival rates for prostate cancer. Prostate Cancer. Atlanta, GA2010.
5. Mohler J, Bahnson RR, Boston B, et al. NCCN clinical practice guidelines in oncology: prostate cancer. J Natl Compr Canc Netw 2010;8:162–200.
6. Albertsen PC, Fryback DG, Storer BE, et al. Long-term survival among men with conservatively treated localized prostate cancer. JAMA 1995;274:626–31.
7. US Preventive Services Task Force. Recommendations for Adults. Available at: http://www.uspreventiveservicestaskforce.org/adultrec.htm. Accessed June 26, 2011.
8. Koebnick C, Langer-Gould AM, Gould MK, et al. Sociodemographic characteristics of members of a large, integrated health care system: comparison with US Census Bureau data. Perm J 2012;16:37–41.
9. Oehrli MD QC, Leyden W. Northern California Cancer Registry: 2004 Report on Trends, Incidence and Outcomes: Kaiser Permanente Northern California; 2004.
10. Young JL Jr RS, Ries LAG, Fritz AG, Hurlbut AA (eds). SEER Summary Staging Manual–2000: Codes and Coding Instructions. Bethesda, MD: National Cancer Institute; 2001.
11. Gleason DF. Classification of prostatic carcinomas. Cancer Chemother Rep 1966;50:125–8.
12. Charlson ME, Pompei P, Ales KL, et al. A new method of classifying prognostic comorbidity in longitudinal studies: development and validation. J Chronic Dis 1987;40:373–83.
13. Duffy CM, Clark MA, Allsworth JE. Health maintenance and screening in breast cancer survivors in the United States. Cancer Detect Prev 2006;30:52–7.
14. Earle CC, Neville BA. Under use of necessary care among cancer survivors. Cancer 2004;101:1712–9.
15. Snyder CF, Frick KD, Herbert RJ, et al. Preventive care in prostate cancer patients: following diagnosis and for five-year survivors. Journal of cancer survivorship: research and practice 2011;5:283–91.
16. Snyder CF, Frick KD, Herbert RJ, et al. Quality of care for comorbid conditions during the transition to survivorship: differences between cancer survivors and noncancer controls. J Clin Oncol 2013;31:1140–8.
17. Khan NF, Carpenter L, Watson E, et al. Cancer screening and preventative care among long-term cancer survivors in the United Kingdom. Br J Cancer 2010;102:1085–90.
18. Snyder CF, Earle CC, Herbert RJ, et al. Trends in follow-up and preventive care for colorectal cancer survivors. J Gen Intern Med 2008;23:254–9.
19. Snyder CF, Earle CC, Herbert RJ, et al. Preventive care for colorectal cancer survivors: a 5-year longitudinal study. J Clin Oncol 2008;26:1073–9.
20. Snyder CF, Frick KD, Kantsiper ME, et al. Prevention, screening, and surveillance care for breast cancer survivors compared with controls: changes from 1998 to 2002. J Clin Oncol 2009;27:1054–61.
21. Snyder CF, Frick KD, Peairs KS, et al. Comparing care for breast cancer survivors to non-cancer controls: a five-year longitudinal study. J Gen Intern Med 2009;24:469–74.
22. Yabroff KR, Lamont EB, Mariotto A, et al. Cost of care for elderly cancer patients in the United States. J Natl Cancer Inst 2008;100:630–41