Factors Predicting Receipt of Prostate Specific Antigen (PSA) testing: Evidence from the National Ambulatory Medical Care Survey (NAMCS) Data

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Introduction

Prostate cancer is the most commonly occurring non-skin cancer among American men constituting about 28% of their total cancer incidence. Detection of prostate cancer increased with the advent of Prostate Specific Antigen (PSA) in the early 1990s. Although the prostate cancer detection rate has declined over the last decade, the absolute number of new cases remains high, consistent with an aging population of increasing size; in 2014 alone, 233,000 new cases of prostate cancer estimated to be occurred (Seigel et al.,2014).

Enormous uncertainty surrounds the effectiveness of PSA screening as the right strategy to diagnose prostate cancer. Screening using the prostate specific antigen (PSA) test remains critical to the early detection and management of PCa. Our objective was to study the factors affecting PSA testing in the US for the year 2010.

Methods

We used National Ambulatory Medical Care Survey (NAMCS) data collected in 2010, the latest publicly available dataset on the Center for Disease and Prevention (CDC) website (CDC, 2015). The survey is administered by the Division of Health Care Statistics, National Center for Health Statistics (NCHS), Centers for Disease Control and Prevention (CDC). This study collects physician reported data on patients' office and community health center (CHC) visit based on a national sample of office-based and community health center (CHC)-based physicians (NAMCS, 2015).

As this study explores the factors predicting the Prostate Specific Antigen (PSA) test screening use rate while visiting physicians for the ambulatory care, we focused on only the visits made by men in the data set. Our study sample was the 9,203 outpatient visits for the men aged 35 years or more.

We estimated the odds ratio from the bivariate analysis which is unadjusted and contained only the dependent variable of PSA test done and the other independent variable of interest. We fitted a logistic regression model to find out adjusted odds ratio with all covariates in the model. We used the survey weight for all analyses. All statistical analyses were performed using STATA 13.1.

Results

Our weighted study sample consisted of primarily White men (87%) between the ages of 50-64 years (35.7%) residing in urban areas (84.7%) covered by private health insurance (50.2%) who were not being seen by a primary care provider (59.8%). Almost 7% of the men had undergone a PSA test. In Bivariate analyses, increasing age had higher odds of having the PSA test done, however the higher odds of doing the test was among the 50-64 years of age (OR=2.54; 95% CI=1.71-3.88). We also found that patients visiting for primary care had higher odds (OR=3.08; 95% CI=2.13-4.46) and with major cause of the visit for preventive care also had higher odds (OR=5.04; 95% CI=3.14-8.09) of doing the test.

Multivariate analysis reveals that 80 years or more years of age (AOR=3.08; 95% CI=1.83-5.19), being routinely consulted for chronic problems (AOR=1.84; 95% CI=1.23-2.75) and preventive services (AOR=4.56; 95% CI=2.80-7.43), being seen by surgical specialty physicians (AOR=1.86; 95% CI=1.11-3.12) increased the likelihood of the visit resulting in a PSA test. While being covered by public insurance (AOR=0.60; 95% CI=0.42-0.88) and uninsured (AOR=0.33; 95% CI=0.15-0.75) and visiting for flare-up of a chronic disease (AOR=0.40; 95% CI=0.18-0.88) had lower chance of doing the test.

Table 1: Survey Weighted Bivariate and Multivariate Analysis of men's visits by uptake of PSA test in United States 2010

Variable	Bivariate Analysis (N=9,203)		Multivariate Analysis (N=8,015)	
	OR[a]	95% CI[b]	AOR[c]	95% CI
Age Group				
35-49 Years	1.00	(Referent)	1.00	(Referent)
50-64 Years	2.58***	(1.71-3.88)	2.45***	(1.60-3.75)
65-79 Years	1.89**	(1.18-3.02)	2.83***	(1.74-4.62)
80+ Years	1.95*	(1.10-3.47)	3.08***	(1.83-5.19)
Race				
White	1.00	(Referent)	1.00	(Referent)
Black	0.93	(0.55-1.57)	0.93	(0.53-1.62)
Others	1.38	(0.70-2.72)	1.63	(0.71-3.76)
Location				
Rural	1.00	(Referent)	1.00	(Referent)
Urban	1.43	(0.93-2.20)	1.29	(0.84-1.98)
Poverty % in Pt. Zip Code				
<10%	1.00	(Referent)	1.00	(Referent)
>=10%	0.87	(0.63-1.20)	1.05	(0.71-1.55)
Education % of univ graduates in pt. Zip code				
<20%	1.00	(Referent)	1.00	(Referent)
>=20%	1.27*	(0.99-1.64)	1.24	(0.90-1.70)
Primary Care Visit				
No	1.00	(Referent)	1.00	(Referent)
Yes	3.08***	(2.13-4.46)	3.29***	(2.06-5.25)
Major Complaint				
New problem	1.00	(Referent)	1.00	(Referent)
Chronic problem, routine	1.71**	(1.18-2.47)	1.84**	(1.23-2.75)
Chronic problem, flare-up	0.55	(0.23-1.30)	0.40*	(0.18-0.88)
Pre-/Post-surgery	0.73	(0.37-1.45)	0.89	(0.49-1.64)
Preventive care	5.04***	(3.14-8.09)	4.56***	(2.80-7.43)
Physician Specialty				
Primary/Medicine	1.00	(Referent)	1.00	(Referent)
Surgery	0.78	(0.53-1.16)	1.86**	(1.11-3.12)
Health Insurance				
Private	1.00	(Referent)	1.00	(Referent)
Medicare	0.72*	(0.52-0.99)	0.60*	(0.42-0.88)
Others	0.20**	(0.06-0.61)	0.33	(0.11-1.01)
Self Pay	0.31**	(0.13-0.71)	0.33**	(0.15-0.75)

[a]OR=Odds Ratio; [b]CI=Confidence interval; [c]AOR=Adjusted Odds Ratio
* p<0.05 **p<0.01 ***p<0.001

Discussions

We found that testing for PSA was more frequent among the older age men as expected. However the uptake of the test increases at 50-64 years age. Race, location or poverty level in the are of location of the patient does not affect the PSA test uptake.

However education has an positive impact on uptaking the test in bivariate analysis, but after controlling for other covariates the effect has gone. Primary care visit has higher likelihood of prescribing a PSA test as expected. Similarly when the visit was intended for preventive care likelihood of having the test done increases manifold.

Public insurance (like Medicare and Medicaid) and out-of –pocket payment has a negative effect on PSA test than the private insurance.

Most striking finding was that surgeons prescribed more PSA test than primary care physicians or medicine specialties. Urologists (a branch of surgery) prescribed more PSA than any other specialties and seem quite rightly so as they more often deal with prostate diseases. But the primary care physicians can also play a dominant role in prescribing PSA test to detect prostate cancer early and prevent harmful effect of the disease.

Conclusions

Contrary to expected standard of practice of primary care physician (PCP) visits influencing PSA testing, our study showed that visiting with a surgeon increased the likelihood of PSA testing. Providing patients with the opportunity to be tested as early as possible during their visit with a PCP might aid in efficiently diagnosing PCa.

References

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