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Differences in the Treatment of Benign Prostatic Hyperplasia: Comparing the Primary Care Physician and the Urologist

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Abstract

Introduction—Benign prostatic hyperplasia is a prevalent chronic condition with expenditures exceeding \$1 billion each year. Little is known about management of patients by primary care physicians compared to urologists. We assessed changes in management after medication initiation in these two settings.

Methods—From the Chronic Condition Warehouse 5% sample of Medicare beneficiaries linked to Medicare Part D data, we defined a cohort of men, 66 to 90 years old, with initial prescriptions for alpha-blocker, 5-alpha reductase inhibitor (5-ARI), or both. We assessed the initial change in therapy for up to four years after medication initiation: add a medication, switch medication, stop medication, or have surgery/retention. We estimated the cumulative incidence functions from competing risks data, and tested equality across groups (primary care physician vs. urologist).

Results—5714 men started medication with a primary care physician, 1970 with a urologist. The most common change in treatment after medication initiation across all groups was medication discontinuation (55% alpha blocker; 46% 5-ARI; 30% combination therapy cumulative incidence at 3 years). Patients who started with primary care physicians were more likely to discontinue BPH-related medications, than patients with urologists (HR 1.19; 95% CI 1.09 – 1.29). The majority of patients who stopped alpha blocker therapy did not have further BPH therapy.

Conclusions—Men given combination therapy are most likely to have continued medication use. Surgical therapy and retention are relatively rare events. Patients who initiate care with urologists are more likely to continue medical therapy than patients with care initiated by primary care providers.

Keywords

benign prostatic hyperplasia; alpha blocker; primary care

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Introduction

Benign prostatic hyperplasia (BPH) is a frequent medical condition as men age. In 2000, approximately 4.5 million visits were made to physicians' offices for the primary diagnosis of BPH, and almost 8 million visits were made with a primary or secondary diagnosis of BPH¹. These visits and treatment of men with symptomatic BPH are a significant burden to the health care system. In fact, BPH-related spending exceeds \$1 billion each year in the Medicare program alone.² Controlling costs of chronic conditions, like BPH, is a centerpiece of health care reform.

In the environment of cost control and health care reform, minimally morbid conditions, such as BPH, will be increasingly managed by the primary care physician (PCP). Medical therapies, alpha-blockers (ABs) and 5-alpha reductase inhibitors (5-ARIs), are efficacious as first line BPH therapies.³⁻⁵ These medications have few side effects, and are commonly prescribed by primary care physicians. However, complicated patients require additional care, including diagnostic testing and surgical interventions, not available through primary care physicians. Such patients may initiate care with urologists, and may have different treatment trajectories than patients who begin care with PCPs.

While differences in initial patient evaluation and treatment between PCP and urology care have been assessed, and trends in BPH medication usage investigated, attention has not focused on subsequent management of patients in the two practice environments.^{6,7} In this study, we assessed the changes in management after medication initiation among urologists and primary care physicians.

Materials and Methods

Cohort Development

From the Chronic Condition Warehouse, a 5% sample of Medicare beneficiaries linked to Medicare Part D data, we extracted a cohort of men, 66 to 90 years of age, with initial prescriptions for BPH related medication (AB or 5-ARI) from 2007 to 2011 using the appropriate national drug codes. We did not include PDE5 inhibitors, anticholinergic medications, or bethanechol as initial BPH prescriptions since these medications are used more commonly in clinical conditions other than BPH. Our initial cohort included men newly prescribed BPH related medications in 2008. We excluded men with prior BPH related medication use in 2007. All patients had continuous Medicare A, B, and D coverage for the year prior to initial prescription fill through one month after the prescription. Patients with an unknown prescriber of the initial medication were excluded. Lastly, those with any surgical therapy or urinary retention prior to first medication use were excluded using CPT and ICD-9 codes (BPH surgery: 52450, 52601, 52620, 52630, 52647, 52648, 52649, 53850, 53852, 55801, 55821, 55831) (Urinary Retention: 51701, 51702, 51703 or ICD-9 codes 788.20, 788.21, 788.29).

Demographics

We assessed patient billing claims for the year prior to initial medical therapy and categorized patients based upon the Charlson Comorbidity Index.⁸ We also examined claims

for other urologic conditions, including hematuria (599.7x), disorders of the bladder (586.x), urinary obstruction (591, 593.3, 593.4, 593.5), UTI (590.x), urethral stricture (598.x), urethritis (597.x), nodular prostate (600.10), PSA elevation (790.93), renal and ureteral stones (592.x), bladder stones (594.x), cystitis (595.x), prostate/kidney/bladder cancer (185, 189.x, 188.x), prostate disorders (602.x), prostatitis (601.x), kidney abnormality (593.0, 593.1, 593.2), hydrocele and spermatocele (603.x, 608.1), orchitis and epididymitis (604.x), phimosis (605), disorder of the penis (607.x).

We also sought to assess the socioeconomic status of patients in the cohort. We determined which patients were dual-eligible beneficiaries (qualifying for both Medicare and Medicaid benefits). Dual eligible patients are more likely younger, poorer, have lower health status, be institutionalized, and use more healthcare dollars than patients without this status.^{9,10} An additional determination of socioeconomic status was the patient's Medicare Part D coverage low-income subsidy (LIS). The LIS provides additional support for low income Medicare recipients for their drug coverage.

We also determined patient's use of primary care. Patients were subdivided by the utilization of primary care from claims: no primary-care related claims (a), single PCP related claim (b), multiple claims for a single PCP (c), majority of claims to a single PCP (d), majority of claims to two PCPs (e), majority of claims to non-primary care, with a single PCP (f), majority of claims to non-primary care with 2 PCPs (g), and, lastly, patients with 3 or more PCPs (h). Ambulatory care sensitive hospitalizations, a marker for primary care quality, were assessed through the use of the ICD-9 codes listed as the primary diagnosis from inpatient claims for 1 year prior to the index medication from the methods of Weissman et al.¹¹

Data Analysis

From this cohort, we assessed the initial change in therapy for up to four years after medication initiation: add a medication, switch medication, stop medication, or have surgery/retention. Medication initiation was the first filled prescription for the medication. We included new prescriptions for anticholinergic medications when determining addition of medication and changes in medication. The use of surgical therapy was determined from CPT codes for TUIP, TURP, laser coagulation, laser vaporization, laser enucleation, TUMT, TUNA, simple prostatectomy, or other related BPH procedures. (CPT codes listed above) Patients not sorted into these categories were considered stable on the initial medication. We used the Fine and Gray method to compare the cumulative incidence of competing risks. We estimated the cumulative incidence functions from competing risks data and tested equality across groups (PCP vs urologist) stratified by initial medical therapy (AB, 5-ARI, or combination therapy) using the open source statistical program R. We used the package, 'cmprsk' (competing risks) for this data analysis (Bob Gray (2014). cmprsk: Subdistribution Analysis of Competing Risks. R package version 2.2–7. <http://CRAN.R-project.org/package=cmprsk>). Within the package we used the functions 'cuminc' (cumulative incidence) to fit the cumulative incidence model and the function 'plot.cuminc' (plot cumulative incidence) to plot the model in a graph. We then assessed the impact of starting medical therapy with a urologist versus PCP controlling for patient age, urologic conditions,

race, socioeconomic status, comorbidity, region of patient residence, and use of primary care with Cox proportional hazards regression.

Results

Demographic Analysis

In this cohort, 8573 men started BPH therapy with alpha blocker or 5-ARIs. 5714 men started medication with a PCP, 1970 with a urologist, 335 had retention at the time of initial therapy, and 554 patients had an unknown type of prescribing physician. Patients starting care with urologists were more likely from the northeast, white, of higher income, and with lower comorbidity burdens than patients who started their care with a PCP (Table 1). Patients who started BPH medical care with urologists were more likely to receive fractured medical care without a usual medical care provider than were patients who started their care with a PCP. Not surprisingly, a significantly higher percentage of patients who started BPH medications with a urologist had other urologic conditions present.

Changes in Medication Use

Men with initial treatment by a urologist were started on a 5-ARI or initial combination therapy more frequently than men started on therapy by a PCP (38 vs. 22 %; $p < 0.001$). The most common change in treatment after medication initiation across almost all groups was to stop use of BPH-related medication (Figure 1). Urologists and PCPs had similar medication discontinuation and change rates when stratified by initial medication class (Table 2). Use of surgery or development of retention was rare in the cohort, with minimal differences between urologists or PCPs (Table 2). When controlling for multiple differences in baseline patient characteristics, patients who started care with primary care physicians were more likely to discontinue medications than patients who started with urologists (HR 1.19; 95% CI 1.09 – 1.29).

Analysis of Secondary Changes in Therapy

After an initial change in medical therapy for BPH, most patients continued to have changes made to their BPH treatment regimen (66%) (Figure 2). We examined secondary changes for patients (6341) initially started on an AB. Of the 3184 (50%) patients who stopped AB therapy, 1797 (56%) stayed off medication. However, 1044 patients (33%) restarted their medication. Among patients who had surgery/retention (142 patients), a minority (14 patients, 10%) continued their AB. A significant minority (43 patients, 30%) had at least one subsequent retention episode, and finally 41 patients (29%) in this subset went off medication. Looking only at the subset of patients who had surgery after initial AB therapy (55 of the 142 surgery/retention patients), 24 stopped all medications after surgery (44% of surgically treated patients). We found no repeat surgery amongst the surgically treated patients, however 9 (16%) did have a subsequent retention episode.

We also looked at those that added a medication to their AB (467 patients). It was most common for these patients to stay on both their AB and additional medication (237 patients, 51%). However, a significant minority had further medication changes (125 patients, 27%).

Discussion

Urologists were significantly more likely to prescribe 5-ARIs than PCPs, either in monotherapy or combination therapy. Medication discontinuation was fairly common, regardless of prescriber discipline. Surgery and urinary retention remained rare occurrences, regardless of the initial prescriber. Overall, patients were medically managed similarly in the primary care and urologist settings, except patients were more likely to remain on medical therapy if the therapy was initiated by a urologist.

In today's era of renewed focus on the costs of medical care, efficient care for chronic, prevalent conditions is emphasized. As a chronic, highly prevalent condition, BPH is a major driver of expense for elderly American men and the Medicare program. Specifically for BPH, treatment costs (1989 dollars) in the US have been estimated as high as \$6 billion (\$4 billion for medical treatment and \$2 billion for surgical procedures).¹² It is estimated that by 2030, 20% of the United States population will be 65 years of age or older, and the fastest growing segment of the population would be those greater than 85 years old.¹³ The growth of the elderly population portends significant financial pressures related to BPH care.

With the development of safe and effective medical therapies, BPH has developed into a medically managed disease. Indeed, even in patients who start medical therapy with urologists, the cumulative incidence of surgery by three years after initiation of therapy was less than 4%. As such, PCPs play a major role in the initial evaluation and treatment of BPH. In a review of data from MCARE, a regional HMO, a significant majority of patients with BPH were initially managed by PCPs.⁶ With the low rates of surgery and retention seen in our study, this shift to PCP management appears warranted. Furthermore, although PCPs use advanced testing for BPH patients far less commonly than urologists,^{6,14} our study shows that medication changes were very similar in the PCP managed and urologist managed patients.

Initial medical care for BPH by the PCP is important since the urology workforce cannot keep up with the projected demand for its services. The number of urologists in the United States peaked in 2009, and is now declining, especially in rural areas. When taking the rising population into account, the supply of urologists per capita has been in decline since 1981.¹⁵ Pruthi et al forecast a 29% reduction in the total number of urologists by 2025. Given this decline, and a freeze in the number of urology trainee positions since 1997, there may be an inevitable shift in the initial care and treatment of prevalent conditions, like BPH, to the PCP.

The patient-centered medical home is a health care reform meant to eliminate fragmented medical care, and in turn eliminate wasteful inefficiencies in the medical sector. For most conditions, PCPs are likely best to lead the group as a patient's personal physician. While some have argued that for genitourinary cancers, urologists may be best suited to provide a medical home,¹⁷ the disproportionately small number of urologists compared to the burden of BPH precludes urologists from serving as the medical home for such a prevalent condition. Instead, urologists could be used as a referral for those with abnormal lower urinary tract symptoms not clearly due to BPH, severe symptoms not likely or able to be managed with medical therapy alone, or patients with urinary retention.

Urologists play a vital role in BPH care, especially for these more complex patients. In our study, we found patients with other urologic conditions were more commonly treated by urologists than by PCPs. These patients have more diagnoses, other conditions requiring work up and management, and the need for the advanced testing available only through a urologist's specialized skills and training. Beyond these advanced patients, urologists provide potentially better care for patients since they are more likely, in our study and others, to prescribe 5-ARIs than PCPs.⁶ Furthermore, patients treated by urologists were more likely to continue medical therapy for BPH than patients with care initiation by PCPs. The increased use of 5-ARIs by urologists, and greater compliance with medical therapy among patients treated initially by urologists, may, from prior randomized trials, translate into decreased downstream complications for patients related to their BPH.¹⁶ Despite treating potentially more complex patients, use of surgery was still rare amongst urologists, suggesting urologists are using clinical discretion in surgical care.

Our study has some limitations. First, our patient population was drawn from a 5% sample of Medicare beneficiaries ranging in age from 66–90. While symptomatic BPH does develop in younger men, the cohort we examined covers the ages with the greatest BPH prevalence. Second, we examined medication utilization from the perspective of filled prescriptions. We cannot be certain that patients actually used the prescriptions that were prescribed. However, the discontinuation rates seen in our study would only be increased if the filled prescriptions were not being used. Third, we were unable to gauge patient symptom severity. In addition, we were not able to assess why a change in BPH management occurred. Possible reasons for medication discontinuation include: medication failure, intolerable side effects, and cessation of symptoms, and greater compliance in urologist treated patients could be related to a higher symptom burden at baseline.

Conclusions

Patients with initial medical management for BPH discontinued all medical therapy less frequently than patients who initiated medical management with PCPs. However, in both groups, surgery and retention were very rare events. With the lack of growth of the urology workforce, and the growing American elderly population, these findings suggest PCPs are the best setting for most men to initiate BPH care, with urologists serving as expert resources for complex or advanced patients who do not respond to initial medical therapy.

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Guide to Abbreviations Used in the Manuscript

5-ARI	5-alpha reductase inhibitor
AB	alpha blocker

BPH	benign prostatic hyperplasia
CPT	Current Procedural Terminology; a code determined by the American Medical Association.
PCP	primary care physician

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Figure 1. Cumulative Incidence of Medication Changes for Patients Initiated on BPH Medication by a PCP or Urologist

This graph demonstrates cumulative medication changes (4 possibilities, y axis) after initial medication prescription over time (x axis). Discontinuation of medical therapy is the most common change across nearly all subgroups, except the combination medication group in the PCP category. In addition, surgery/retention remained a rare change across all subgroups.

Figure 2. Analysis of the Secondary and Tertiary Medication Changes for those Initiated on an Alpha Blocker

Half of patients who began alpha blocker therapy, discontinued the medication (Go Off Medication: 3184 Patients). In this group, approximately one third restarted their alpha blocker during follow up (Restart Alpha Blocker: 1044 patients). Surgery or retention was a rare event as a secondary (142 patients; 2%) or tertiary change (195 patients; 5% of all tertiary changes) after initial medical therapy.

Table 1

General Demographics of the Primary Care and Urologist Groups

Variable	Primary Care (N=5714)	Urologist (N=1970)	p-value
Age			0.287
Mean	75.7	75.6	
St. Dev.	6.4	6.1	
Number of Urologic Conditions			<0.001
Mean	0.4	0.8	
St. Dev.	0.7	0.9	
Race			<0.001
White	78.5%	82.8%	
Black	7.4%	5.6%	
Other/Unknown	14.1%	11.5%	
Dual Status			<0.001
Complete	26.6%	16.8%	
Partial	5.0%	1.5%	
None	68.4%	81.7%	
Subsidy			<0.001
Deemed	29.0%	17.5%	
LIS	6.4%	4.3%	
None	64.6%	78.2%	
Charlson			<0.001
CCI=0	37.9%	42.9%	
CCI=1	30.8%	32.7%	
CCI=2	16.0%	15.7%	
CCI>=3	15.4%	8.7%	
Care Type			<0.001
No Primary Care Claims	24.1%	22.0%	
One outpatient Primary Care Claim	2.8%	0.2%	
One PCP with Multiple Claims	8.4%	0.3%	
Most Claims to a Single PCP	20.3%	17.6%	
Two PCPs with most claims to Primary Care	10.6%	7.4%	
Majority of care to non-PCPs with a Single PCP present	22.1%	37.3%	
Most claims to non-PCPs with more than one PCP present	5.7%	9.5%	
3 or more PCPs	6.1%	5.8%	
Ambulatory Hospital			<0.001
No	95.8%	98.7%	
Yes	4.2%	1.3%	
Region			<0.001
Northeast	15.9%	19.5%	

Variable	Primary Care (N=5714)	Urologist (N=1970)	p-value
South	39.6%	41.4%	
Midwest	23.8%	22.3%	
West	20.8%	16.8%	
Initial Medical Therapy			<0.001
Alpha Blocker	78.4%	61.9%	
5-ARI	12.3%	25.0%	
Combination Therapy	9.4%	13.1%	

Table 2

Cumulative Incidence at 3 years - Supplement to figure 1.

Alpha Blocker						
Event	Primary Care			Urologist		
	Cumulative Incidence	95% CI - Lower	95% CI - Upper	Cumulative Incidence	95% CI - Lower	95% CI - Upper
Go off medication	55.4%	53.8%	57.0%	53.1%	50.2%	56.1%
Add a medication	8.7%	7.8%	9.6%	8.5%	6.8%	10.1%
Switch medication	2.8%	2.3%	3.3%	4.1%	3.0%	5.3%
Surgery/Retention	2.0%	1.5%	2.4%	4.0%	2.8%	5.2%
5-ARI						
Event	Primary Care			Urologist		
	Cumulative Incidence	95% CI - Lower	95% CI - Upper	Cumulative Incidence	95% CI - Lower	95% CI - Upper
Go off medication	45.8%	41.9%	49.7%	44.0%	39.5%	48.6%
Add a medication	11.3%	8.8%	13.7%	9.6%	6.9%	12.3%
Switch medication	2.3%	1.1%	3.4%	3.5%	1.8%	5.1%
Surgery/Retention	0.8%	0.1%	1.6%	2.5%	1.0%	3.9%
Combination						
Event	Primary Care			Urologist		
	Cumulative Incidence	95% CI - Lower	95% CI - Upper	Cumulative Incidence	95% CI - Lower	95% CI - Upper
Go off medication	29.5%	25.3%	33.7%	35.3%	29.1%	41.5%
Add a medication	2.4%	0.9%	3.8%	0.8%	0.0%	1.9%
Switch medication	33.4%	28.9%	37.9%	33.4%	27.2%	39.6%
Surgery/Retention	1.9%	0.7%	3.8%	3.6%	1.1%	6.0%