

Cost Comparison of Finasteride and Dutasteride for Enlarged Prostate in a Managed Care Setting Among Medicare-aged Men

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Benign prostatic hyperplasia, also known as an enlarged prostate (EP), is an age-related progressive disorder affecting more than 50% of men aged ≥ 50 years.^{1,2} The prevalence rate of EP has been shown almost to double from 13.5% in men over 50 years of age to 26.7% in men over 65 years of age.³ The annual cost of managing the condition has been estimated at \$26 billion.⁴ With the continued increase in the aging population, the number of men aged ≥ 65 years is projected to expand from 17 million in 2010 to ~ 30 million by 2030,⁵ signaling the potential for a significant health and economic burden. Patients with EP often experience lower urinary tract symptoms, such as frequency and weak stream. As the disease progresses, more serious complications can arise, including acute urinary retention (AUR) or prostate-related surgery. From a managed care perspective, the economic implications of EP present a compelling need to assess various treatment options to provide improved quality of care and optimize patient outcomes.

Pharmacologic management of EP includes the use of alpha-blockers and 5-alpha reductase inhibitors (5ARIs). Alpha-blockers provide rapid symptomatic relief but do not alter disease progression and, thereby, do not reduce the risk of AUR or the need for prostate surgery. 5ARIs block the production of dihydrotestosterone (DHT), the primary androgen responsible for prostatic growth, and reduce the risk of progression to AUR or prostate surgery.⁶⁻⁹ It has been estimated that men aged ≥ 50 years with EP have a 19.2% chance of having AUR or prostate surgery within 1 year of medical treatment initiation.¹⁰ Approximately 85% of these men with EP were treated with alpha-blockers alone.¹⁰ Hence, 5ARIs may have a greater role in reducing the risk of AUR, prostate surgery, and resulting healthcare resource consumption in patients with EP.

The therapeutic role of 5ARIs in treating EP is well accepted. There are two 5ARIs available, dutasteride and finasteride. Mechanistically, dutasteride provides dual inhibition of the 5-alpha reductase isoenzymes (type 1 and type 2), whereas finasteride inhibits only the type 2 isoenzyme.⁹ Dual-enzyme inhibition has been shown to produce greater reductions in serum DHT compared with inhibition of only the type 2 isoenzyme (93% vs 62%, respectively).^{1,11}

Finasteride recently became available as a generic medication and

Abstract

Objective: To assess cost differences between dutasteride and finasteride use within the first year of initiating treatment for enlarged prostate (EP) among men aged ≥ 65 years in a managed care setting.

Methods: For this retrospective analysis, medical/pharmacy claims data from July 1, 2003, to June 30, 2006, were analyzed for EP patients aged ≥ 65 years who were treated with dutasteride or finasteride. Analysis of average monthly costs over each patient's 1-year follow-up period incorporated total charges for EP-related medical care, including physician, inpatient and outpatient hospital care, emergency department, and other ancillary services.

Results: A total of 4498 patients met selection criteria, with comparable demographics between treatment cohorts. Patients taking dutasteride incurred \$51 less per month in medical expenses than finasteride-treated patients (\$122 vs \$173; $P < .001$), attributable to lower monthly inpatient hospitalization costs (\$55.84 vs \$70.34), outpatient costs (\$22.07 vs \$44.25), and physician office visit costs (\$40.69 vs \$51.10).

Conclusion: Medicare-aged patients treated with dutasteride incurred \$51 less per month in medical costs than those treated with generic finasteride, suggesting that the higher price of dutasteride may be offset by decreased medical resource consumption.

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For author information and disclosures, see end of text.

Table 1. Inclusion and Exclusion ICD-9-CM Codes

Inclusion ICD-9-CM Codes	
Benign prostatic hypertrophy	222.2, 600
Exclusion ICD-9-CM Codes	
Prostate cancer	185, 198.82, 233.4, 236.5, 239.5, V10.46
Bladder cancer	188, 198.1, 223.3, 233.7, 236.7, 239.4, V10.51

ICD-9-CM indicates International Classification of Diseases, Ninth Revision, Clinical Modification.

now is priced lower than dutasteride. Given the importance of cost control to managed care organizations (MCOs), this price difference has led many MCOs to position finasteride on a lower tier than dutasteride on their drug formularies. This strategy, however, only considers pharmacy costs. A broader look at the total cost of EP, including medication costs and inpatient, outpatient, and physician costs, must be considered to determine whether either medication carries an overall cost advantage.

Using a medical claims database, the present study analyzed the total healthcare charges that occurred over 12 months after the initiation of medical therapy with finasteride or dutasteride in men over 65 years of age with EP.

Methods

Data Source

Data from patients receiving finasteride and dutasteride during the 3-year period between July 1, 2003, and June 30, 2006, were collected from the Ingenix Lab/Rx proprietary research database. The database provided deidentified information of medical and pharmacy claims for more than 30 million health plan members, encompassing up to 10 years of historical data. Diagnostic information was identified using *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD-9-CM) codes,¹² and procedures were identified using *Current Procedural Terminology 4* codes and prescription records. Dates of service and both paid and charged amounts were available for all services rendered.

Sample Selection

Men aged ≥65 years who were diagnosed with EP and treated with either dutasteride or finasteride, between July 1, 2003, and June 30, 2006, were identified. Patients were excluded if they had an ICD-9-CM code for prostate or bladder cancer, received doses of 5ARIs indicative for male pattern baldness treatment, or if they had used 2 different 5ARIs dur-

ing the assessment period. **Table 1** lists all relevant inclusion and exclusion ICD-9-CM codes.

Comorbidity Assessment

The Charlson Comorbidity Index (CCI) with the Dartmouth-Manitoba and Deyo modification was used in evaluating the various patient comorbidities in the study. The index contains 19 medical conditions, each of which is scaled from 1 to 6, with a total maximum score of 33. The higher the score, the higher the burden of comorbidities.^{13,14} The index scores were derived from the various ICD-9-CM codes within the 12-month period of each patient’s indexing date.

Staging of Enlarged Prostate

The Thomson Medstat Disease Staging coding criteria were used to identify patients with EP placed on 5ARI therapy and their corresponding disease severity stage.¹⁵ Based on electronic screening and identification of a comprehensive map of ICD-9-CM diagnosis codes, Thomson Medstat is a proprietary staging methodology that has been used extensively as a classification system for diagnostic categories. These criteria are 1 of 4 systems selected for dissemination with the Healthcare Cost and Utilization Project Nationwide Inpatient Sample (HCUP-NIS). Patients initiated on 5ARI treatment in the system were categorized into 1 of 7 disease stages within the 12-month period before their index dates. Patients categorized as ≥stage 1.2 were deemed to have complicated EP. Patients with hematuria (ICD-9-CM code 599.7) and/or bladder stones (ICD-9-CM codes 592.0, 592.1, 592.9, and 594.1) were also identified to capture additional severity risks. **Table 2** lists the various severity stages and their corresponding ICD-9-CM codes.¹⁵

Patient Matching—Propensity Scoring

To minimize confounding variables, the propensity score matching technique was used. The propensity score technique matched patients on the probability of receiving dutasteride or finasteride given the following covariates: age, CCI, use of alpha-blockers, AUR, use of urologist care, bladder stones, hematuria, and the presence of prostate-related complications. Patients in each treatment were matched 1:1 within ±0.001 percentage point after calculating the probability of receiving dutasteride.

Outcomes Analysis

In evaluating the amount of medical resource utilization, costs were defined as the total amount charged for physician visits, inpatient hospitalizations, outpatient hospital care, emergency department visits, and other services. To adjust for varying follow-up times, monthly average charges were calculated for each patient and used as the units for analysis. EP-related costs were defined as claims with a primary ICD-9-CM code of 222.2 or 600.xx. A gamma-distributed generalized linear model with a log-link function was used to detect statistical differences in monthly cost claims. All statistical analyses were conducted using SAS version 9.1.3, with an a priori significance level of alpha = 0.05.

Results

Demographic Characteristics

A total of 4498 patients with EP were identified and analyzed in the study. The demographic characteristics of these patients are summarized in **Table 3**. Because of the matching methodology, the demographic characteristics were not significantly different between the finasteride and dutasteride groups. The mean age of the sample was 73.6 years, with more than 67% of patients in both groups seeking urologist care before initiating 5ARI therapy.

Economic Analysis

The average per-patient monthly medical charges for EP-related services, including a breakdown of charges by physician, inpatient and outpatient hospital care, emergency department, and other ancillary services, are shown in the **Figure**.

Overall, Medicare-aged patients receiving dutasteride had significantly lower medical resource utilization compared with patients treated with finasteride (\$122 vs \$173 per month, respectively). The absolute difference between the 2 treatments in EP-specific charges was \$51 per month ($P < .001$). The lower medical charges with dutasteride were the result of lower inpatient hospitalization expenditures (\$55.84 vs \$70.34 per month), outpatient hospitalization expenditures (\$22.07 vs \$44.25 per month) and physician expenditures (\$40.69 vs \$51.10 per

Table 2. Thomson Medstat Disease Staging for Enlarged Prostate

Stage	Description	ICD-9-CM Codes
1.1	Benign prostatic hypertrophy	222.2, 600.xx
1.2	With urinary tract infection	Stage 1.1 + 599.0
2.1	With bladder outlet obstruction	Stage 1.1 + 593.5, 596.0, 599.6
2.2	With hydronephrosis	Stage 1.1 + 591.xx
3.1	With renal failure	Stage 1.1 + 584.xx, 586.xx
3.2	With sepsis	Stage 1.1 + 038.xx
3.3	With shock	Stage 1.1 + 785.50, 785.59

ICD-9-CM indicates International Classification of Diseases, Ninth Revision, Clinical Modification.

Table 3. Baseline Demographics of Study Population

	Finasteride (N = 2249)	Dutasteride (N = 2249)	P Value
Age (mean, SD), years	73.6 (6.5)	73.6 (6.4)	.90
Pre-EP-related costs (mean, SD), \$	276 (1778)	242 (980)	.43
AB prior, %	47.2	45.6	.29
Pre-AUR, %	25.1	23.7	.25
Eligible months (mean, SD)	8.4 (4.0)	8.3 (4.0)	.47
CCI (mean, SD)	1.4 (2.1)	1.3 (1.8)	.69
Complicated EP, %	5.7	6.3	.38
Use of urologist care, %	67.5	67.8	.85
Bladder stones, %	5.2	4.8	.54
Hematuria, %	18.4	17.3	.35

SD indicates standard deviation; EP, enlarged prostate; AB, alpha-blocker; AUR, acute urinary retention; CCI, Charlson Comorbidity Index.

month). These differences were driven by 121 inpatient prostate-related hospitalizations (\$8500 per hospitalization; \$1169 per patient hospitalized per month) for the finasteride cohort versus 90 prostate-related hospitalizations (\$10,907 per hospitalization; \$1489 per patient hospitalized per month) in the dutasteride group; and 170 prostate-related outpatient hospital visits (\$3607 per visit; \$523 per patient visit per month) for the finasteride cohort versus 116 prostate-related outpatient hospital visits (\$3038 per visit, averaging \$405 per patient hospitalized per month) for the dutasteride cohort. In general, dutasteride patients had lower rates of AUR and surgery across each practice setting (**Table 4**).

Discussion

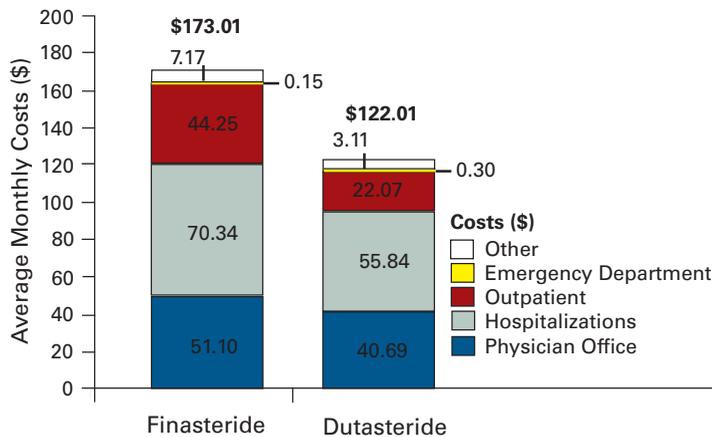
The objective of this study was to assess the healthcare cost differences for Medicare-aged patients within 1 year of initiating treatment with dutasteride or finasteride. The Ingenix Lab/Rx Database was used

Table 4. Rates of AUR/Surgery Across Practice Settings

	Inpatient Hospital Care		Outpatient Hospital Care		Emergency Department		Other	
	Dutasteride	Finasteride	Dutasteride	Finasteride	Dutasteride	Finasteride	Dutasteride	Finasteride
AUR, %	3.4	5.3	3.3	6.8	1.0	1.6	1.7	3.8
Surgery, %	3.4	5.0	3.4	3.7	0	0	0.3	0.4

AUR indicates acute urinary retention.

Figure. Patient Average Monthly Costs



to compare healthcare charges over 12 months for patients in these 2 groups. The results indicate that patients on dutasteride incurred lower medical charges (\$51 less per month [$P < .001$]) than patients using finasteride. The charge differences between the 2 groups resulted primarily from lower inpatient and outpatient hospitalization charges and lower physician office charges for patients receiving dutasteride. The hospitalization cost differences appear to result from lower rates of AUR and prostate surgery in the dutasteride group.

These findings support previous studies suggesting that healthcare costs are lower in men treated with dutasteride than in men treated with finasteride. In a younger population (men >50 years of age), Fenter et al found that patients using dutasteride incurred \$20.50 less in medical costs per month than those receiving finasteride. In the present study, the magnitude of difference was greater (\$51.00 vs \$20.50 per month). This difference can be at least partially explained by the higher rates of AUR and surgery that occur in an older population of men with EP, which could increase the economic benefit of dutasteride.^{16,17}

These results may be important when deciding on the best choice of a 5ARI. The price of generic

finasteride compared with branded dutasteride must be analyzed in the context of overall healthcare costs. The current wholesale acquisition price of dutasteride (\$2.79) and generic finasteride (\$1.43) gives finasteride a \$40.80 monthly medication cost advantage over dutasteride ($\$2.79 - \$1.43 = \$1.36 \times 30 = \40.80). However, the results of the present study suggest an overall cost savings of \$51 per month for men taking dutasteride, which would create an overall cost advantage for dutasteride despite its higher price. There is also significant additional value to patients who have a lower risk of AUR or prostate surgery after receiving dutasteride, although the monetary value of this benefit is difficult to quantify.

The results of this study suggest that the reduction in AUR and prostate-related surgery highlighted in earlier articles in this supplement may confer significant economic benefits. A lower risk of complications is consistent with decreased patient morbidity, lower medical resource utilization, and a decreased economic burden. Fewer complications would be expected to increase patient quality of life. It has been reported that ~70% of EP costs are related to hospitalization and physician office visits.¹⁰ This finding is substantiated by the present study, which showed that the main drivers of cost differences between dutasteride and finasteride were hospitalization and office charges. These results, when combined with evidence from Issa et al,¹⁸ Fenter et al,¹⁷ and the previous articles within this supplement, strongly suggest differences in clinical and economic outcomes between dutasteride- and finasteride-treated patients.

In assessing the application of this economic study to clinical practice, several factors should be considered. This study evaluated healthcare cost differences associated with use of the two 5ARIs over a 12-month period; pharmacy-related costs were not included in the database. In addition, the retrospective nature of this work cannot rule out con-

founding factors that may have influenced the cost differences seen in this study. Moreover, the tolerability, safety, and efficacy of the products were not examined, and the clinical superiority of either medication cannot be determined from this study. The data collected for this study were evaluated based on a 1-year follow-up period. Hence, the results of this analysis should not be extrapolated beyond this time period. In calculating the average cost per month, the total costs incurred by the patient during the study period were divided by the number of months during the follow-up period for that specific patient. This method provides the most practical cost data for healthcare decision makers, because all patients who met study criteria were included in the analysis regardless of follow-up time.

The results of this study suggest that there are healthcare cost differences between treating men with EP with dutasteride versus finasteride. For health insurers, pharmacy benefits managers, and other healthcare decision makers, these data suggest that fewer EP-related complications and a lower surgery rate with dutasteride can lead to significantly lower medical resource utilization and a resultant cost savings among men aged ≥ 65 years. Since this study used a commercial Medicare-aged population, future analysis should assess the economic impact of 5ARI data in an actual Medicare population once pharmacy data are available to be analyzed.

Conclusions

Medicare-aged men treated with dutasteride consumed significantly less medical resources because of lower inpatient and outpatient hospitalization and office visit charges, resulting in cost savings of \$51 per month per patient. This cost difference is more than the increased cost of dutasteride over generic finasteride (\$40.80 per month).

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