Medication Adherence and Health Care Costs with the Introduction of Latanoprost Therapy for Glaucoma in a Medicare Managed Care Population

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ABSTRACT

Background: Latanoprost, a prostaglandin inhibitor, is increasingly being used in the therapeutic management of glaucoma. However, there is scant literature examining the cost and outcome ramifications of latanoprost.

Objectives: This study examined the medication use behavior (medication-related persistence and adherence rates) and costs associated with the introduction of latanoprost therapy in a treatment-naive older population (aged ≥65 years) enrolled in Medicare.

Methods: The study employed a retrospective observational cohort design and used administrative claims data from a Medicare health maintenance organization (HMO), which offered complete coverage to enrollees, including prescription benefits. The case group consisted of patients with glaucoma who began latanoprost therapy. The control group consisted of enrollees with glaucoma who started any therapy other than latanoprost. Both groups were followed up for 1 year before and after initiation of therapy. Bivariate and multivariate techniques incorporating health care utilization in the year before the start of new therapy were used to determine the study outcomes.

Results: The case group comprised 101 patients (mean age, 77.60 years), while the control group included 168 patients (mean age, 77.59 years). There were no significant differences across the 2 groups with respect to age, sex, general health scores on the 12-item Short-Form Health Survey, severity of comorbidity, or the proportion of respondents with perception of worsened health. Introduction of latanoprost therapy was associated with higher medication persistence (hazard ratio, 0.90; 95% CI, 0.68–0.98) and adherence rates (mean [SD], 0.51 [0.26] vs 0.40 [0.25]; $P < 0.001$) compared with patients starting other glaucoma medication. Furthermore, there were no additional increases in total health care costs in the entire population associated with the introduction of latanoprost therapy, after adjusting for group and time effects, as well as other confounders (mean [SD], $4718.24 [$8982.92] vs $4046.55 [$6505.39]).

Conclusions: Latanoprost therapy offered improved medication use behavior in these older adults enrolled in a Medicare HMO. There were no significant additional increases in overall health care costs as a result of introduction of latanoprost therapy, after adjusting for group and time effects, as well as other baseline confounders in this study cohort. (*Am J Geriatr Pharmacother.* 2007;5:100–111) Copyright © 2007 Excerpta Medica, Inc.

Key words: glaucoma, open-angle glaucoma, medication adherence, elderly.

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INTRODUCTION

Glaucoma, sometimes referred to as a "silent blinder," is the second leading cause of blindness overall and the leading cause among blacks and Hispanics in the United States.[1–3] Glaucoma is usually asymptomatic until late in its course. As many as 50% of glaucoma patients in developed countries are unaware that they have the disease.[4] The incidence of glaucoma is predicted to be between 1.1% and 3% of the US population, with the incidence increasing to ~6% in patients aged ≥65 years.[5] The major risk factors for glaucoma are age ≥65 years, family history of glaucoma, certain systemic diseases (eg, hypertension, diabetes mellitus, hyperthyroidism), myopia, and black descent.[6] The most commonly occurring form of the disease in western populations is primary open-angle glaucoma, an increase in intraocular pressure (IOP) with resulting damage to the optic nerve, deterioration of visual fields, and eventual loss of vision. Open-angle glaucoma affects >2 million Americans, a finding that is expected to rise to >3 million by 2020 considering the rapid aging of the US population.[7]

Treatment for glaucoma is usually focused on IOP reduction with medications, as this is believed to prevent or arrest deterioration of the optic nerve and visual fields by reducing aqueous humor production or increasing aqueous outflow. Laser and surgical procedures are mostly reserved for patients who do not respond to drug therapy. Some of the factors that could impact achieving optimal IOP in a patient may include effectiveness of a medication, disease progression, and patient adherence.[5,6]

In recent years, prostaglandins have emerged as the mainstay of treatment for open-angle glaucoma, and latanoprost is frequently used as primary therapy.*[8,9] Latanoprost belongs to the category of prostaglandin analogues and reduces IOP by increasing the uveoscleral flow without affecting the aqueous flow. Latanoprost was introduced in the US market in late 1996 as an antiglaucoma medication and has been widely used as an adjunctive and often primary therapy, possibly due to its QD administration schedule and effective IOP-lowering effects.[9] The drug reduces IOP by 30% in patients with open-angle glaucoma and is well tolerated in most patients.[9] In a randomized study of 35 patients with open-angle glaucoma, Polo et al[10] compared the effect on IOP at the end of 2 weeks and 3 months of latanoprost (n = 18) versus timolol plus dorzolamide (n = 17). In this patient cohort, latanoprost (0.005%), administered QD, showed significantly better long-term reduction (at the end of 3 months of therapy) in IOP than combined therapy with timolol plus dorzolamide (timolol 0.5%, BID; dorzolamide 2%, BID). Similar to latanoprost, other prostaglandin analogues (eg, bimatoprost, travoprost [both approved in 2001]) effectively manage glaucoma by lowering IOP levels.[8]

All these prostaglandins offer a convenient QD dosage schedule. Common adverse effects of these medications include increased iris pigmentation[8] and hyperemia, predominantly in predisposed eyes. Previous clinical trials indicated hyperemia rates ranging from 5% to 15% for latanoprost,[11] 15% to 45% for bimatoprost,[12] and 35% to 50% for travoprost.[13] Latanoprost was the only prostaglandin analogue approved by the US Food and Drug Administration (FDA) as a first-line agent for open-angle glaucoma and ocular hypertension when the present study was conducted[14] and was generally regarded as a first-line agent by glaucoma specialists soon after its introduction in 1996.[15] Bimatoprost was approved by the FDA in 2006 as a first-line therapy for elevated IOP-associated open-angle glaucoma or ocular hypertension.[16]

Medication use behavior, as determined by medication-related persistence and adherence among glaucoma patients, is an important issue. *Persistence to medication* refers to the duration of continuous medication use as prescribed,[17] and *adherence* refers to the extent to which a person's behavior (eg, following prescribed medication regimen and a diet, and/or executing lifestyle changes) corresponds with advice/recommendations from health care professionals.[18] Both adherence and persistence to pharmacotherapy are important in treating chronic conditions, as patients' nonadherence to the treatment regimen may result in poor outcomes, including treatment failure, resistance to the therapy, medication overdose, disease progression, otherwise preventable hospitalizations, and unnecessary medical expenditures.[19] Overall, patients' failure to follow the prescribed medication regimen for their chronic condition may cost as much as $300 billion to the US health care systems.[19] The lack of overt symptoms early in the stage of disease may tend to decrease the medication-related persistence/adherence among glaucoma patients.[4] The estimated medication nonadherence rate ranged between 23% and 59% for glaucoma patients,[20–22] and the rate was found to be lower (23%) in Medicaid-enrolled patients older than 65 years.[22] In one retrospective study of glaucoma patients enrolled in a large national health care provider obtained through a third-party anonymous source (PharMetrics Inc., Watertown,

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