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DISCLAIMER

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WITH THE INTRODUCTION OF MEDICARE PART D IN 2006, MEDICARE Quality Improvement Organizations (QIOs) were directed to collaborate with Medicare Part D prescription drug plan providers to improve the safety, efficiency and effectiveness of prescription drug use.¹ Quality Partners of Rhode Island, the Medicare-contracted QIO for Rhode Island, initiated an effort to improve the quality of medication use among that state's Medicare beneficiaries with diabetes mellitus. Selecting diabetes presented a logical starting point, because epidemiologic studies have described the under-use of medications.²⁻⁷ Additionally, patients with diabetes can be identified from pharmacy claims data with an acceptable level of specificity.

This initiative sought to increase the use of lipid-lowering and angiotensin-directed drug therapies (i.e. **angiotensin-converting enzyme inhibitors (ACEIs) and angiotensin receptor blockers (ARBs)**), from the perspective of both prescribing and patient adherence. When this study was initiated, the **American Diabetes Association (ADA)** recommended that all senior patients with diabetes be treated with statin therapy to achieve cholesterol reduction, regardless of baseline LDL level.⁸ The ADA also recommended that ACEI/ARB therapy be prescribed for patients having both diabetes and hypertension, a

group which comprised "the majority of people with diabetes".⁸ The ADA noted that "ACE inhibitors have been shown to improve cardiovascular outcomes in high-cardiovascular risk patients with or without hypertension."

Quality Partners collaborated with the University of Rhode Island College of Pharmacy, provider groups, and several Medicare Part D drug plans in the state. The initiative included academic detailing by a clinical pharmacist, presentations at physician group meetings, dissemination of educational materials, and targeted letters presenting physician-level prescribing rates for ACEI/ARB and lipid-lowering therapies. The audience learned the utilization rates of ACEI/ARB and lipid-lowering therapies among Part D plan enrollees having diabetes, and the significant differences in the rates of use of these therapies among sub-groups. This report presents that data.

METHODS

We conducted cross-sectional analyses of dispensings of ACEI/ARB and lipid-lowering drugs for two 6-month periods: January 1 - June 30th, 2006; and January 1 - June 30th, 2007. Pharmacy data were provided by several but not all Medicare Part D prescription drug plans operating in Rhode Island during 2006 and 2007. The pharmacy data included patient age and gender; a prescriber identifier (DEA number); the drug name and quantity, and the date of dispensing. For 2007, information describing gender was missing for approximately one-third of patients and was imputed based on the percentage of patients in the population for which gender was documented.

Among patients receiving medications for diabetes, we determined the percentage of patients who were dispensed an ACEI/ARB and a lipid-lowering drug therapy at least once during a 6-month period. Lipid-lowering therapies included both statin and non-statin medications.

We classified age as 50-64 years, 65-74 years, or 75 years of age or older. We hypothesized that medication utilization would be higher among patients with coronary artery disease, and we used the proxy of receiving a prescription for a nitrate-containing product to identify this comorbidity. We also sought to determine if ACEI/ARB and lipid-lowering therapy utilization rates were higher among patients receiving care from one of the physician group practices that were participating in this initiative,

Table 1. Patient and Provider Characteristics among a Sample of Diabetic Medicare Part D Plan Enrollees in Rhode Island, 2006 and 2007

Characteristics	January 1 – June 30, 2006 N = 5,009 n (%)	January 1 – June 30, 2007 N = 7,331 n (%)
Age (years)		
50-64	621 (12.4)	916 (12.5)
65-74	2,080 (41.5)	3,108 (42.4)
75 +	2,308 (46.1)	3,307 (45.1)
Gender		
Female	2,989 (59.7)	4,390 (59.9)
Male	2,020 (40.3)	2,940 (40.1)
Coronary artery disease (receiving nitrates)		
Yes	461 (9.2)	635 (8.7)
No	4,548 (90.8)	6,696 (91.3)
Physician affiliation		
Group practice collaborator	2,795 (55.8)	4,083 (55.7)
Other	2,214 (44.2)	3,248 (44.3)
Endocrinologist care		
Yes	708 (14.1)	1,071 (14.6)
No	4,301 (85.9)	6,260 (85.4)

and thus compared rates of use among patients receiving prescriptions from physicians affiliated with these groups versus patients receiving prescriptions from physicians not affiliated with these groups. ACEI/ARB and lipid-lowering therapy rates were assessed among patients receiving at least one dispensing for any medication from an endocrinologist as compared to patients who did not receive prescriptions from an endocrinologist.

Within-group comparisons for each year were conducted, and reported here as the frequency and percent of use of ACEI/ARB and lipid-lowering medications. For these analyses we assessed the statistical significance of group differences using the chi-square test.

RESULTS

Part D pharmacy data were provided for nearly 38,000 Medicare beneficiaries, representing approximately 40% of the population of beneficiaries enrolled in Medicare drug plans in Rhode Island during 2006 and 2007. For 2006, we identified 5,009 patients who received medications for diabetes; in 2007, 7,331 such patients.

Table 1 presents descriptive statistics for the patients. Most were older: roughly 12% were younger than 65 years. Approximately 9% of patients received dispensings for nitrate-containing medications. Slightly more than half of patients (56%) received medications from a practitioner affiliated with one of the collaborating group practices. Roughly 15% of patients received medication from an endocrinologist.

Table 2 presents overall rates of use of ACEI/ARB and lipid-lowering therapies for the two periods. For the analysis using 2006 data, 69% of beneficiaries received at least one dispensing for an ACEI or ARB medication, and 63% of pa-

Table 2. Use of ACEI/ARB and Lipid-lowering Medications among a Sample of Diabetic Medicare Part D Plan Enrollees in Rhode Island, 2006 and 2007

	January 1 – June 30, 2006 N = 5,009 n (%)	January 1 – June 30, 2007 N = 7,331 n (%)
ACEI/ARB	3,478 (69.4)	5,123 (69.9)
Lipid therapy	3,165 (63.2)	4,796 (65.4)

Abbreviation: ACEI/ARB = angiotensin-converting enzyme inhibitors and angiotensin receptor blockers

tients received at least one dispensing for a lipid-lowering drug. In the following year, 70% of patients received at least one dispensing for an ACEI or ARB medication, and 65% received at least one dispensing for a lipid-lowering drug. The increased utilization of lipid-lowering therapy observed between 2006 and 2007 was statistically significant ($p < 0.05$).

Table 3 presents the patient characteristics identified in Table 1 by ACEI/ARB and lipid-lowering therapy utilization for the 2007 period. Statistically significant differences ($p < 0.05$) were found for nearly all comparisons. Both the youngest and oldest patient groups were found to be less likely to receive these drug therapies, compared with patients in the 65-74 age category. Women received these drug therapies more frequently than men (74% versus 70% for ACEI/ARB therapy; 70% versus 63% for lipid therapies), as did patients who also received dispensings for nitrate-containing products (75% versus 69% for ACEI/ARB therapy; 77% versus 64% for lipid therapies). Patients receiving prescriptions from physicians affiliated with one of the group practice collaborators more frequently received an ACEI/ARB or lipid-lowering therapy (72% versus 68% for ACEI/ARB therapy; 68% versus 62% for lipid-lowering therapies, $p < 0.05$ for both comparisons). Patients who received prescription dispensings from an endocrinologist received both ACEI/ARB and lipid-lowering therapies more frequently, yet only the latter was a statistically significant difference ($p < 0.05$).

DISCUSSION

Our study reveals that a majority of the Medicare beneficiaries with diabetes identified in this analysis were receiving lipid-lowering and ACEI/ARB therapies. But a substantial percentage of patients with diabetes did not receive these therapies.

These results suggest higher ACEI/ARB and lipid-lowering therapy utilization rates in Rhode Island than those reported nationally and in other locales. For example, using data from the 2003 Medicare Current Beneficiary Survey, Tjia and Briesacher³ reported ACEI/ARB and statin rates of use among seniors with diabetes to be less than 50%. In another study using data from the National Ambulatory Medical Care Survey, Segars and Lea² found that fewer than one in four visits made by diabetic patients included mention of the prescribing of a statin medication. In another study of more than 30,000 diabetic Medicare patients in Pennsylvania, Winkelmayr et al⁴ reported rates of use of ACEI/ARB therapy to be approximately 50%.

Caution should be applied in comparing our results with other research, given differing data sources, populations, and methodologies. Yet it is evident that in our study, ACEI/ARB and lipid-lowering medications were frequently prescribed among diabetic Medicare beneficiaries, and at higher rates than reported elsewhere.

Patients in the 65-74 year old age group received both medication classes more frequently than those in the younger and older age categories. Perhaps this indicates a greater prevalence of severe illness among the oldest patients, such as advanced renal disease and other conditions where lipid management was a lesser priority. Yet the less frequent utilization of lipid-lowering medications among the oldest patients perhaps reflects a lack of clinical aggressiveness that may not be justified.⁹ The lower frequency of use of these medications among younger patients is also of concern. Physicians may be less inclined to prescribe these medications among younger, healthier diabetic patients. Perhaps this results from younger patients' poorer adherence in refilling medications. Regardless of the cause, our analyses point out that younger diabetic patients received these medications less frequently.

To determine if these medications were more likely to be received among patients having coronary disease, we used a proxy of receiving nitrate-containing prescriptions to identify such patients. While this method is a poorly sensitive means for identifying patients with coronary disease, we believed it to be sufficiently specific, and would provide some evidence of known-groups validity. The results revealed that patients re-

ceiving prescriptions for nitrate-containing medications also more frequently received ACEI/ARB and lipid-lowering medications. Among users of nitrate-containing products, approximately 1 in 4 did not receive a dispensing for a lipid-lowering medication during the study timeframe.

This project entailed collaboration with local physician group practices. We sought to determine if ACEI/ARB and lipid-lowering drug utilization rates were higher among physicians affiliated with these practices, compared with overall rates among physicians not affiliated with these practices. We found that rates of use of these medications were higher for patients receiving prescriptions from physicians affiliated with one of the collaborating group practices

As a final sub-group analysis, we determined if rates of medication use were higher when a patient was receiving care from an endocrinologist. Indeed, patients receiving medications from an endocrinologist more frequently filled prescriptions for ACEI/ARB and lipid-lowering therapies, with a substantial and statistically significant difference in the use of lipid-lowering therapies (72% versus 64%, $p < 0.05$). While one may theorize that patients receiving care from an endocrinologist may have been further along the continuum of disease, we note that statin therapy is recommended for most senior patients with diabetes.^{10, 11}

Several factors may explain why the utilization rates for these medications are less than 100%. First, the pharmacy claims data used for this analysis identified dispensed prescriptions only. It is likely that many patients were prescribed these medications yet did not refill them, because patient adherence to chronic medication therapies is poor.^{12, 13} For this reason we applied a liberal threshold in classifying patients as using these therapies, giving credit even if a patient received just one prescription dispensing during the 6-month measurement period.

A second explanation for the lower calculated rates of use of these medications pertains to our inability to identify and exclude patients having a contraindication to these drug therapies. However, for both lipid-lowering and ACEI/ARB medications, many types of contraindications to one class of drugs would not preclude the use of a medication from a different class. For example, ARB medications would be an acceptable alternative for most patients that experienced a bothersome cough from an ACEI. Similarly, because some patients are poorly tolerant of statin medications, we also included non-statin lipid-lowering medications such as fibrates and bile acid resins in our analysis. We do not mean to imply that these other classes of lipid-lowering medications are acceptable and evidence-based alternatives to statin therapy, but rather may have been a necessary second-line option.

Third, patients may have received medications as samples, or bought these medications for cash through discount programs (e.g. \$4 generics). The data provided by the Part D drug plans would not have captured this data. Yet the patients in this study were identified as having diabetes based on their receipt of prescription medication dispensings for hypoglycemic medications under Part D, indicating that patients were utilizing their Part D benefit at least to purchase some drugs.

Table 3. Use of ACEI/ARB and Lipid-lowering Medications According to Patient and Provider Characteristics, January 1 – June 30, 2007 (N = 7,331)

Characteristic	ACEI/ARB n (%)	Lipid therapy n (%)
Overall percentage:	5,123 (69.9)	4,796 (65.4)
Age (years)		
50-64	611 (66.7)	591 (64.5)
65-74	2,280 (73.4)	2,190 (70.5)
75 +	2,232 (67.5)	2,015 (60.9)
Gender		
Female	3,236 (73.7)	3,090 (70.4)
Male	2,063 (70.2)	1,840 (62.6)
Coronary artery disease (receiving nitrates)		
Yes	473 (74.5)	488 (76.9)
No	4,650 (69.4)	4,308 (64.3)
Physician affiliation		
Group practice collaborator	2,930 (71.8)	2,769 (67.8)
Other	2,193 (67.5)	2,027 (62.4)
Endocrinologist care		
Yes	770 (71.9)	774 (72.3)
No	4,353 (69.5)	4,022 (64.3)

Abbreviation: ACEI/ARB = angiotensin-converting enzyme inhibitors and angiotensin receptor blockers

$p < 0.05$ for all comparisons except by endocrinologist care among patients receiving ACEI/ARB therapy

Fourth, to mitigate the potential effect of being in the Part D coverage gap (i.e. the “donut hole”), we analyzed pharmacy claims data from the first 6 months of the year, before most patients would have fallen into that gap.

CONCLUSION

This report describes rates of use of two clinically important drug therapies for patients having diabetes mellitus. While a majority of patients were receiving these medications, approximately 30% of patients did not fill prescriptions for an ACEI/ARB therapy, while 35% of patients did not receive a dispensing for a lipid-lowering medication. We note that this may reflect either failure to prescribe, or the failure of patient persistence in refilling medication. We cannot ascertain which cause may have contributed the most to our findings.

Patients received these medications more frequently if they were age 65-74 years (compared with younger and older groups), and also if they were female. Patients dispensed medications prescribed by a physician affiliated with one of the collaborating provider groups more frequently received these therapies. Lipid-lowering medications were more frequently utilized by patients under the care of an endocrinologist.

We hope these findings may help identify patients who should be receiving these therapies.

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Disclosure of Financial Interests

The authors have no financial interests to disclose.

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