Medicare Accountable Care Organizations and Antidepressant Use by Patients With Depression

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Objective: This study examined whether Medicare accountable care organization (ACO) programs were associated with early changes in antidepressant use or adherence among beneficiaries with depression.

Methods: A difference-in-difference design was used to compare claims from Medicare fee-for-service beneficiaries (2009–2013) and ACO patients with those from local control groups. Outcome measures were total antidepressant days supplied, filling one or more antidepressant prescriptions, and proportion of days covered (PDC) by supply among antidepressant users (adherence).

Results: Among antidepressant users, ACO contracts were associated with slight differential increases in PDC (.4–.8 percentage point, $p \leq .03$), depending on ACO program and entry year. The proportion of patients with one or more prescriptions was unchanged or decreased slightly for ACO patients with depression, such that total supply did not consistently increase.

Conclusions: Medicare ACO programs were associated with early modest increases in antidepressant adherence but not with increases in the proportion of patients with depression who received antidepressants.

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In an effort to improve health care quality and reduce spending, accountable care organization (ACO) models are rapidly being adopted as an alternative to fee-for-service payment for commercially insured and Medicare populations (1). ACOs in Medicare's Pioneer model and the Medicare Shared Savings Program (MSSP) are eligible to share savings with Medicare if they keep total spending (Parts A and B) for their attributed populations below a financial benchmark set by the Centers for Medicare and Medicaid Services (CMS) while also meeting performance benchmarks based on 33 quality measures. In addition, both Pioneer ACOs and two of three tracks in the MSSP share risk with Medicare for spending that is in excess of the financial benchmark. Starting in January 2012, 32 organizations entered the Pioneer ACO program. In April and July of 2012, 114 organizations joined the MSSP, and another 106 joined in January 2013. The MSSP has grown since, and CMS introduced the Next Generation ACO model in 2016 (2). Currently, 525 provider organizations participate in Medicare ACO programs, encompassing more than ten million Medicare beneficiaries (3,4). Prior studies found that Pioneer and MSSP ACOs have had modest success in reducing spending while maintaining or slightly improving performance on quality measures (5–7)

Patients with behavioral health conditions would be a logical focus of ACO efforts to improve quality and reduce health care spending because medical spending is higher for patients with behavioral health conditions compared with those without such conditions (8). If ACOs were to focus on patients with behavioral health conditions, they might begin by targeting patients with depression. There is a robust research base demonstrating that, compared to usual care, integrating depression care into primary care improves depression outcomes at similar costs (9). Also, depression is associated with nonadherence to medical treatment (10). Therefore, ACOs may have incentives to better manage depression in an effort to better manage chronic medical conditions. Although a recent empirical evaluation of Medicare ACO programs found no increases in recording of depression diagnoses (11), early behavioral health initiatives could have resulted in other changes in depression care. Therefore, the purpose of this research was to examine whether Medicare ACO programs are associated with changes in antidepressant use and adherence among beneficiaries with depression.

METHODS

This study was approved by the Harvard Medical School Institutional Review Board. In each year from 2009 to 2013, we examined claims data for a 20% random national sample of fee-for-service Medicare beneficiaries who were continuously

enrolled in Parts A, B, and D during the claims data year and the prior year. In each year, the 20% sample is a 20% sample of the entire Medicare population, including all living members of the prior year's sample plus a 20% sample of newly eligible beneficiaries. Among these beneficiaries, we identified those who had one or more inpatient or two or more outpatient claims with a depression diagnosis (*ICD-9* codes 296.2, 296.3, 300.4, 301.12, 309.1, and 311) in the preceding or concurrent year. We excluded beneficiaries with schizophrenia/psychotic or bipolar disorder spectrum diagnoses (*ICD-9* codes 295, 296.1, 296.4–296.9, 297, 298, 301.11, and 301.13). Using previously described methods (11), we attributed each beneficiary to the ACO or non-ACO provider accounting for the most primary care services received by the beneficiary during the year. We were unable to examine comorbid substance use disorders because claims with these diagnoses were redacted in compliance with the federal substance use disorder privacy regulation 42 CFR Part 2.

Annually, for each beneficiary with depression, we assessed total days of antidepressant supplied, any antidepressant use (a dichotomous indicator), and the proportion of days covered (PDC) among antidepressant users—a standard claims-based measure of adherence (12). Total days supplied was defined as the sum of the days covered by antidepressant prescriptions in the study year. Antidepressant medications included tricyclics, tetracyclics, serotonin reuptake inhibitors, serotonin-norepinephrine reuptake inhibitors, monoamine oxidase inhibitors, bupropion, vortioxetine, and mirtazapine. Beneficiaries without an antidepressant prescription were considered to have zero days covered. Thus changes in the total days supplied reflected changes in both any use among beneficiaries with depression and adherence among those taking antidepressant medications.

PDC was defined as the total days supplied divided by the number of days the patient was expected to be on antidepressants during the year. The denominator for the PDC measure (expected days) equaled 365 for established users or the number of days remaining in the year after the first prescription fill for new users. New users were defined as beneficiaries with depression who did not have an antidepressant prescription fill in the prior 12 months. If the days supplied exceeded the denominator (for example, because of multiple antidepressants), we truncated the numerator to the denominator so that the PDC could not exceed one. We did not distinguish between antidepressant classes in our measures, thereby considering switches from one class to another as continued adherence to prescribed antidepressants.

Using a difference-in-differences approach and linear regression, we compared changes from before to after the start of ACO contracts for each measure of antidepressant use or adherence among ACO-attributed beneficiaries with concurrent changes among beneficiaries attributed to non-ACO providers (control group). The precontract period was 2009–2011 for Pioneer ACOs and ACOs entering the MSSP in 2012, and 2009–2012 for 2013 MSSP entrants. We excluded 2012 as a transition year for the 2012 MSSP entry cohort, because they entered in mid-2012. Thus we examined postcontract years 2012 and 2013 for Pioneer ACOs and postcontract year 2013 for the 2012 and 2013 MSSP entrants (pooled to improve power).

Regression models included the following beneficiary demographic and clinical characteristics: age, sex, race-ethnicity, Medicaid coverage, Medicare eligibility due to disability or end-stage renal disease, whether beneficiaries were long-term nursing home patients in the prior year, whether beneficiaries had each of 26 conditions in the Chronic Conditions Data Warehouse as of the prior year, beneficiaries' Hierarchical Chronic Condition score (calculated for each beneficiary in each year by using diagnoses from the prior year's claims), and whether claims indicated diagnosis of an anxiety disorder (*ICD-9* code 300) or other psychiatric disorder (excluding schizophrenia/psychotic or bipolar disorders) in the prior year. In addition, on the basis of U.S. census data, we included the proportions of residents below the federal poverty level, with a high school degree, and with a college degree living in each beneficiary's area of residence (zip-code tabulation area). Finally, the regression models included fixed effects for each combination of hospital referral region and year to adjust for geographic differences between ACO-attributed beneficiaries and the control group and for local changes in antidepressant use in the control group. We used robust variance estimators to account for clustering at the ACO level (for the ACO group) or hospital referral region level (for the control group).

RESULTS

Any differences between the ACO and the control groups in observed demographic and clinical characteristics remained stable from the precontract to postcontract period, with one notable exception: in 2013 there was a 1.5% differential decrease in beneficiaries in the Pioneer ACOs who qualified for Medicare because of a disability. [A table presenting data on sample characteristics is included in an online supplement to this report.] During the precontract period, trends in antidepressant use and adherence were similar for the ACO and control groups.

In Pioneer ACOs, there was a significant differential increase in the total days of antidepressants supplied in 2012 (4.2 days, p=.006), constituting a 1.9% increase relative to a baseline mean of 223.7 days supplied (Table 1). This increase in total days supplied was attenuated in 2013 (2.2 days) and was no longer statistically significant. The differential increase in total days supplied was driven by a significant differential increase in adherence (PDC) for beneficiaries in Pioneer ACOs in both 2012 (.8 percentage point, or a 1.0% differential increase relative to a baseline mean of 78.1%; p=.007) and 2013 (.9 percentage point, or a 1.2% relative increase; p=.02). For beneficiaries attributed to MSSP ACOs, no differential change was noted in total days of antidepressant supplied. For MSSP-attributed beneficiaries, there was a small but significant differential increase in

TABLE 1. Differential changes in antidepressant use and adherence among patients with depression in accountable care organizations (ACOs) and a control group[a]

ACO and measure	Precontract period[b]			Precontract to postcontract change, ACOs versus control group	
		ACOs versus control group			
	Unadjusted M (in 2011)	Difference	Difference in trend	Post year 2012	Post year 2013
Pioneer ACOs[c]					
Total days supplied	223.7	.5	1.1	4.2**	2.2
Any antidepressant use (%)	83.0	.2	.2	.3	−.4
Among antidepressant users, proportion of days covered by days supplied (%)	78.1	.2	−.1	.8**	.9*
MSSP ACOs[d]					
Total days supplied	223.7	3.4***	−.4	na	−.5
Any antidepressant use (%)	83.0	.1***	−.1	na	−.5*
Among antidepressant users, proportion of days covered by days supplied (%)	78.1	.3	−.1	na	.4*

[a] The control group consisted of patients attributed to providers that did not enter into an ACO contract (either Pioneer or Medicare Shared Savings Program [MSSP]) with Medicare by 2013.
[b] The precontract period was 2009–2011 for Pioneer ACOs and ACOs entering the MSSP in 2012, and 2009–2012 for 2013 MSSP entrants.
[c] Pioneer ACO sample size: precontract period, N=19,502 person-years; post year 2012, N=7,577 person-years; post year 2013, N=7,963 person-years. Control group sample size: precontract period, N=446,508 person-years; post year 2012, N=172,487 person-years; post year 2013, N=186,701 person-years.
[d] MSSP ACO sample size: 2012 entry MSSP precontract period, N=38,062 person-years; 2013 entry MSSP precontract period, N=43,008 person-years; 2012 entry MSSP post year 2013, N=16,112 person-years; 2013 entry MSSP post year 2013, N=14,246 person-years. Control group sample size: 2012 entry MSSP precontract period control group, N=446,508 person-years; 2013 entry MSSP precontract period control group, N=619,355 person-years; 2012–2013 entry MSSP postcontract period control group, N=186,701 person-years.
*p<.05, **p<.01, ***p<.001

PDC in 2013 (.4 percentage point, or a .5% relative increase; p=.03) and a small decrease in the proportion taking antidepressants (−.5 percentage point, or a .6% relative decrease; p=.04).

DISCUSSION

We found consistent early evidence of limited improvements in medication adherence associated with the Pioneer and MSSP ACOs among antidepressant users with depression but no consistent evidence of changes in the proportion of patients with depression who received antidepressants. These findings contribute to evidence of unchanged or improved quality of care associated with participation in the Medicare ACO programs (5–7) in general. Our findings are also consistent with recent quantitative research that found limited gains in performance on other behavioral health quality metrics associated with ACOs (11,13). More generally, the absence in ACOs of large effects on antidepressant use and adherence is consistent with previous documentation that depression is commonly underrecognized and undertreated (14).

Recent qualitative research found that although many Medicare ACOs had implemented or augmented programs to improve behavioral health care, or depression care more specifically, the degree to which they had done so was mixed (15). In addition, leaders of Medicare and commercial ACOs have described considerable challenges in improving behavioral health care management, including inadequate data availability for managing behavioral health due to federal and state privacy restrictions that limit information sharing between behavioral health and general medical providers, incomplete data on substance use disorders provided by CMS because of restrictions from 42 CFR Part 2, and shortages of mental health care providers (13,15).

Our study was limited by its observational design, and it is possible that compositional changes in the ACO sample contributed to changes in antidepressant use. However, our finding of increased antidepressant adherence was present in both Pioneer and MSSP ACOs and in both postcontract years for Pioneer ACOs, whereas compositional changes that might have biased estimates (mainly the differential decrease in disabled beneficiaries observed in the Pioneer group in 2013) were not consistently detected across programs and postcontract years. Moreover, the ACO programs are voluntary, and ACOs likely differ from non-ACO providers in many respects. Thus our results may not support generalizations about the expected effects of ACO program incentives on later participants. Of greater concern, providers opting to enter the ACO programs could have done so in part because of favorable trends in quality, including antidepressant use and adherence. We found no evidence for such selection bias, however, because trends in antidepressant use and adherence were similar during the precontract period for ACOs and the control group. A final limitation is that the substantial dropout from the Pioneer program that began in 2013 could have contributed to the observed attenuation in the effect on total days of antidepressants

supplied, but we lacked sufficient power to isolate the effect of program exit on antidepressant use in the latter half of 2013.

CONCLUSIONS

Our results indicate evidence of some early modest gains in antidepressant adherence in Medicare ACO programs. It will be important to understand how the limited gains suggested by our results evolve as organizations gain more experience managing behavioral health care under risk-based ACO contracts.

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