Academic detailing with audit and feedback to improve antipsychotic pharmacotherapy

Supplemental Section

Complete methods for Medicaid claims preparation:

Identifying the target population of beneficiaries

We obtained Medicaid medical and pharmaceutical claims for years 2009 - 2013. We defined our study cohort as beneficiaries 18 years and older as of 01/01/2009 who had at least two community mental health center rehabilitation service claims separated by six months in each year, indicating they were likely to be receiving longitudinal services for severe mental illness. The sample included 35,570 adult Medicaid recipients. A "home" mental health center was assigned to each individual based on the billing provider identification code for his or her rehabilitation claims within each year. The 2.5% of individuals who had claims associated with more than one center in a year were assigned to the center at which they received services for the longest period of time. Almost all (99%) individuals who had services at more than one center only had one claim at a second center. We then linked antipsychotic claims filled by the study cohort to the database. Data preparation and analyses proceeded with de-identified claims.

Assigning psychiatric diagnosis to beneficiaries with antipsychotic prescription fills:

Since many individuals had multiple mental health ICD-9 codes attached to their claims, we hierarchically assigned individuals into one of the mental health diagnostic categories, using the following order: (1) schizophrenia and psychotic disorders; (2) bipolar disorders; (3) depressive disorders; (4) anxiety disorders; (5) substance use disorders; (6) personality disorders; and (7) other diagnoses. For analyses, schizophrenia/psychotic disorders and bipolar disorders were grouped together because antipsychotics have FDA indications for both types of disorders.

Identifying treatment utilization:

Admissions to emergency departments and hospitals for mental illness are a marker of illness symptom severity and have been associated with antipsychotic polypharmacy (1). To identify individuals with an emergency department admission for mental health reasons, we used common procedure terminology (CPT) codes for emergency department evaluation and management services, place of service code, and associated ICD-9 codes for mental illness diagnosis. To identify individuals with inpatient hospital admissions we used a similar strategy and selected inpatient stays longer than 1 day.

Identifying and preparing antipsychotic medication fills:

The outcomes of interest were: (1) monthly proportion of recipients with polypharmacy fills (two or more types of antipsychotics filled for greater than 60 consecutive days) among all recipients with antipsychotic fills, (2) monthly proportion of recipients with high-risk antipsychotic fills among all recipients with antipsychotic fills;

and (3) monthly proportion of recipients with low-risk antipsychotic fills among all recipients with antipsychotic fills. High risk agents included olanzapine, quetiapine, chlorpromazine, and thioridizine. We did not include clozapine as a high-risk medication target for reduction because the primary indication for this agent consists of severe treatment resistant psychosis for individuals that have failed to benefit from routinely used antipsychotic medications. Despite the association of clozapine with metabolic and other side effects, it was not considered to be an appropriate target for switching to an alternative low risk antipsychotic medication and was excluded from consideration in this study. Low risk agents included ziprasidone, aripiprazole, asenapine, lurasidone, fluphenazine, haloperidol, molindone, pimozide).

For the analysis predicting monthly proportion of recipients with high-risk antipsychotic fills we took an inclusive approach. For each recipient, each month with at least one high-risk antipsychotic fill was assigned a high-risk status even if the recipient also filled medium or low-risk medications for the same month. For the analysis predicting monthly proportion of recipients with low-risk antipsychotic fills, we reversed the logic and assigned low-risk status to the months with at least one low-risk medication fill.

For the analysis predicting antipsychotic polypharmacy, we defined polypharmacy as fills by a recipient for any two or more antipsychotics overlapping for at least 60 consecutive days. Using the approach of Morrato et al. (2), we used date of service in the Medicaid pharmacy file as a prescription fill date and the "days supply" field as a marker of duration of the pharmacotherapy per each medication fill. We first identified periods of use of each antipsychotic for each individual. To account for late

medication fills in a sequence of antipsychotic treatment, we added 20% of the days supply plus 14 days to each antipsychotic prescription duration. Adjacent prescription fills of the same antipsychotic were then aggregated to create the period of use. When periods of use of any two or more different antipsychotic medications overlapped longer than 60 days, the months in which overlap occurred were labeled as antipsychotic polypharmacy. Two months were allowed for periods of switching from one antipsychotic to another with overlapping prescriptions. Transitioning from one agent to another with less than two months of concurrent treatment with two antipsychotics was not considered antipsychotic polypharmacy. The polypharmacy window start date was the initial fill date when a second antipsychotic agent began to overlap with the first. If a third medication was added during this window (with or without dropping the second agent) the polypharmacy status carried on until the number of antipsychotic medications dropped back to one or none, or until the end of the study (08/31/13). We labeled each month for each recipient with antipsychotic fills either polypharmacy or monotherapy based on these calculations.

Demographics

Gender and age were available in the Medicaid files. We categorized age into three groups (18-29, 30-39 and >=40 years old). Young patients are more likely to develop cardiometabolic side effects (3), and older individuals may be more susceptible to side effects and more likely to experience adverse drug events associated with polypharmacy (4), thus prescribing may differ in age groups.

Intervention cohort

Mental health centers that received the intervention beginning in 2010 were designated “early cohort,” those that received the intervention beginning in 2012 were designated “late cohort.” This designation was used to control for a potential priming effect of the overall health initiative received by the late cohort.

References

1. Bolstad A, Andreassen OA, Røssberg JI, et al: Previous hospital admissions and disease severity predict the use of antipsychotic combination treatment in patients with schizophrenia. BMC Psychiatry 11:126, 2011

2. Morrato E, Dodd S, Oderda G, et al: Prevalence, utilization patterns, and predictors of antipsychotic polypharmacy: experience in a multi-state Medicaid population, 1998-2003. Clinical Therapeutics 29:183-95, 2007

3. Correll CU, Manu P, Olshanskiy V, et al: Cardiometabolic risk of second-generation antipsychotic medications during first-time use in children and adolescents. Journal of American Medical Association 302:1765-73, 2009

4. Wallace J, Paauw DS: Appropriate prescribing and important drug interactions in older adults. Medical Clinics of North America 99:295-310, 2015