Antipsychotic Medication Prescribing in Children Enrolled in Medicaid

David C. Rettew, MD, Jeanne Greenblatt, MD, MPH, Jody Kamon, PhD, Diane Neal, RPh, Valerie Harder, MHS, PhD, Richard Wasserman, MD, Patricia Berry, MPH, RN, Charles D. MacLean, MD, Nancy Hogue, BS, PharmD, William McMains, MD

abstract

BACKGROUND: Although the increase in treatment of children and adolescents with antipsychotic medications has been well documented, much less is known about the factors related to the use of these agents and how closely the treatment follows best practice recommendations.

METHODS: Prescribers of each antipsychotic medication prescription issued for a Medicaid-insured child in Vermont aged <18 years were sent a prior authorization survey that assessed several domains including the clinical indication, other treatments, metabolic monitoring, prescriber specialty, and prescription origin. These variables were combined to categorize prescriptions as following indications approved by the US Food and Drug Administration (FDA) and best practice guidelines.

RESULTS: The response rate of the survey was 80%, with 677 surveys from 147 prescribers available for analysis; more than one-half of the respondents were primary care clinicians. Overall, the clinical indication for an antipsychotic prescription followed best practice guidelines 91.7% of the time, with overall best practice guidelines followed at a rate of 50.1%. An FDA indication was followed in 27.2% of cases. Psychiatrists were significantly more likely to follow best practice guidelines than nonpsychiatrists. Antipsychotic medications were typically used only after other pharmacologic and nonpharmacologic treatments were ineffective, although previous treatment with cognitive-behavioral therapy was uncommon (15.5%). Metabolic monitoring that included serial laboratory tests was reported in 57.2% of cases.

CONCLUSIONS: Current prescribing patterns of antipsychotic medications for children and adolescents follow best practice guidelines approximately one-half of the time, with nonadherence often related to lack of metabolic monitoring.

WHAT'S KNOWN ON THIS SUBJECT: Although the rates of antipsychotic medication treatment are rising for children and adolescents, little is known about the factors associated with this practice.

WHAT THIS STUDY ADDS: This study provides some of the first data regarding when and why clinicians decide to use antipsychotic medications. It reveals clues as to how prescribing might better follow best practice guidelines.
The well-established increase over the past 2 decades in antipsychotic medication treatment among children and adolescents has generated considerable attention, both within the mental health community and the public at large. Several studies have demonstrated sharp rises in antipsychotic treatment among Medicaid-insured and privately insured children.1–5 The prevalence of antipsychotic medication use among youth is estimated at 1% to 3% among Medicaid-insured youth, which is about double the rate of those with private insurance.6–8 Concern that the increase represents an overuse of this class of medications has come from evidence that antipsychotic agents are frequently prescribed outside of indications approved by the US Food and Drug Administration (FDA) and before other types of treatments have been attempted.9–11 Another source of concern pertains to the adverse effects of antipsychotic medications, some of which may be more common in youth compared with adults. These adverse effects include movement disorders,12 metabolic problems, weight gain,13 and sedation.

Although the prevalence and trends related to antipsychotic medication use have been well documented in the existing literature, significant gaps in our understanding remain. Pharmacy and claims-based analyses, although extremely valuable, provide limited information related to the process behind these prescribing patterns. Such judgments are at the core of the debate, namely whether the right youth are being prescribed the right medications at the proper time in their treatment. Clinician surveys are another tool that have been used to understand prescribing,14 but due to their voluntary nature, they are susceptible to selection bias and very low return rates.

The motivation for the present study was developed from the deliberations of the Vermont Psychiatric Medications for Children and Adolescents Trend Monitoring Workgroup, which is charged with making recommendations to other state agencies regarding psychiatric medications for Vermont youth. The committee consists of representatives from the clinical community as well as government agencies such as the Department of Mental Health and Department of Vermont Health Access (which oversees Medicaid). The goal of the present study was to examine important factors related to the prescribing of antipsychotic medications to young Medicaid beneficiaries in the hopes of identifying areas for further attention and support.

METHODS

Sample

The subjects for this study were the prescribers of each antipsychotic medication issued within a 4-month period (July–October 2012) for a Vermont Medicaid-insured patient aged <18 years. These clinicians from across all medical specialties were identified by the Department of Vermont Health Access at the time the antipsychotic medication prescription was filled.

Measures

Two of the study authors (D.C.R. and J.G.) developed the survey (Supplemental Fig 1), which was then edited by the trend monitoring workgroup and approved for use by the Vermont Medicaid Drug Utilization Review Board. The study was approved by the University of Vermont’s Committee on Human Research in the Medical Sciences.

Each prescription prompted an individual survey; thus, prescribers with multiple patients taking antipsychotic medications received a separate survey for each patient. Questions focused on the following: (1) the indication for the medication, both diagnostically and related to primary target symptoms; (2) the initiating prescriber; (3) other pharmacologic and nonpharmacologic interventions for the indicated target symptoms, both current and past; and (4) metabolic monitoring.

The questionnaire constituted a prior authorization in that its completion was necessary for the continued authorization of the medication. Extensions were granted on an individual clinician basis, and a small number of prescribers were granted an exception due to claims that the timely return of the survey was too much of a hardship.

Analysis

Descriptive statistics were calculated from the survey responses; differences between various groups (eg, age groups, gender) were analyzed by using χ² statistics.

Although our process was not designed to make a definitive quality judgment, we categorized a prescription as meeting an FDA indication based on the specific medication, dose, patient age, and diagnosis. Regarding best practice, we used the American Academy of Child and Adolescent Psychiatry’s “Practice Parameters for the Use of Atypical Antipsychotic Medication in Children and Adolescents” as the basis for determining compliance (http://www.aacap.org/App_Themes/AACAP/docs/practice_parameters/Atypical_Antipsychotic_Medications_Web.pdf). These criteria are summarized as follows.

1. Antipsychotic medications are considered first-line medication treatment of bipolar disorder, schizophrenia, tics/Tourette’s, and autism (recommendation 2).

2. Antipsychotic medications are second-line treatment of several other diagnoses and behaviors (disruptive behavior disorders, aggression, eating disorders, and posttraumatic stress disorder) after other pharmacologic and nonpharmacologic treatments have been tried (recommendation 2).
3. Antipsychotic medications are not recommended for patients aged <5 years (recommendation 2).
4. Combination therapy with multiple antipsychotic medications is not advised (recommendation 8).
5. Regular monitoring for metabolic adverse effects during antipsychotic medication use is recommended (recommendations 11–13). Best practice guidelines were considered as being met if the clinician indicated that he or she was performing a regular laboratory evaluation or was aware that another physician was performing it. We did not insist that the evaluation be conducted at a specified interval.
6. Dosing should be as low as possible and not exceed the maximum recommended dose for adults (recommendation 4).

Some recommendations, such as first assessing a family history of diabetes, could not be determined with this relatively brief instrument. For problems in which antipsychotic medication treatment is considered first-line treatment, best practice was considered present if the aforementioned conditions 3 through 5 were met. For second-line conditions such as disruptive behavior disorders and anxiety disorders, a best practice designation also required that at least 1 other type of medication had been tried first along with a trial of some form of psychotherapy. Ultimately, excessive dosing (condition #6) was not present in our sample.

To examine the association between a prescription following best practice guidelines (yes or no) and a number of predictor variables, a generalized linear mixed effects logistic regression was performed by using Stata version 12 (Stata Corp, College Station, TX). Our original data were hierarchical, with 2 levels of nesting (patients nested within providers and patients taking 2 or 3 medications).

Including the second level of nesting based on the small number of patients taking multiple antipsychotic medications resulted in an unstable statistical model. Therefore, for the small number of patients with >1 prescription, we retained 1 prescription per patient, leaving us with a 1-level hierarchical model. Our final model tested whether the odds of adhering to best practice guidelines for prescribing antipsychotic medications differed by provider type (psychiatrist versus other), controlling for the potential confounding effects of patient age, patient gender, and a 3-level categorical variable (low, medium, and high based on tertiles) for total number of antipsychotic prescriptions written by the provider.

**RESULTS**

Of the total 978 surveys sent, 778 (79.6%) were returned. Of those surveys received, 56 (7.2%) patients were no longer taking the antipsychotic medication, 34 (4.8%) were no longer being seen by the physician, and 2 (0.4%) were returned blank. In 8 (1.0%) patients, a separate survey was completed for 2 doses of the same medication. These responses left a total of 677 surveys, representing 647 individual children and 147 prescribers. An additional 95 surveys (12%) contained some missing data that prevented their use for all variables. These data were treated as missing at random.

Demographic information on the participants and prescribers are shown in Table 1. The patients’ mean age was 13.2 years (range: 3–18 years), and the sample was 70% male. Only 2 children were aged <5 years.

Although psychiatrists or psychiatric nurse practitioners comprised 45.1% of the individual prescribers (22.2% were child psychiatrists), they wrote 65.2% of the antipsychotic prescriptions. About one-half (52.2%) of the prescribers were primary care clinicians, including pediatricians (30.6%) and family physicians (16.0%).

A small number of prescribers were responsible for the majority of the antipsychotic prescriptions. Specifically, 8.8% of the survey respondents wrote 52.7% of the total prescriptions. Of this smaller group of

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Mean ± SD</th>
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<tr>
<td>Child’s age, ya</td>
<td>13.2 ± 3.1</td>
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**Table 1. Characteristics of Antipsychotic Prescriptions for Medicaid Youth (N = 677)**

<table>
<thead>
<tr>
<th>Prescriber specialty (per prescription)</th>
<th>N (%)</th>
</tr>
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<tbody>
<tr>
<td>Child psychiatrist</td>
<td>302 (44.6)</td>
</tr>
<tr>
<td>General psychiatrist</td>
<td>79 (11.7)</td>
</tr>
<tr>
<td>Psychiatric NP</td>
<td>60 (8.9)</td>
</tr>
<tr>
<td>Pediatrician</td>
<td>187 (27.6)</td>
</tr>
<tr>
<td>Pediatric NP</td>
<td>8 (1.2)</td>
</tr>
<tr>
<td>Family physician</td>
<td>26 (3.8)</td>
</tr>
<tr>
<td>Family medicine NP</td>
<td>4 (0.6)</td>
</tr>
<tr>
<td>Neurologist</td>
<td>2 (0.3)</td>
</tr>
<tr>
<td>Other</td>
<td>5 (0.7)</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Medication frequency</th>
<th>Mean (Range), mg</th>
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<tbody>
<tr>
<td>Risperidone</td>
<td>314 (46.4)</td>
</tr>
<tr>
<td>Quetiapine</td>
<td>190 (28.1)</td>
</tr>
<tr>
<td>Aripiprazole</td>
<td>107 (15.8)</td>
</tr>
<tr>
<td>Ziprasidone</td>
<td>50 (7.4)</td>
</tr>
<tr>
<td>Olanzapine</td>
<td>6 (0.9)</td>
</tr>
<tr>
<td>Chlorpromazine</td>
<td>5 (0.7)</td>
</tr>
<tr>
<td>Other</td>
<td>5 (0.7)</td>
</tr>
</tbody>
</table>

NA, not applicable; NP, nurse practitioner.
* Based on individual patients (n = 647) rather than according to prescription.
clinicians writing the majority of prescriptions, most were child psychiatrists or general psychiatrists; only 15.4% were pediatricians. Risperidone was the most commonly prescribed antipsychotic (46.4%), followed by quetiapine (28.1%) and aripiprazole (15.8%). Together, these 3 medications comprised >90% of the antipsychotic prescriptions. As shown in Table 1, the doses of these medications did not exceed the FDA maximum recommended doses for adults in any of the study cases. A total of 28 patients (4.3%) were taking 2 antipsychotic medications during the study period, and 1 patient was taking 3 antipsychotic medications.

**Medication Origin**

A large minority (42.4%) of the prescriptions were initiated by someone other than the current prescriber, as shown in Table 2. Of those, 66.2% of the prescriptions originated with a psychiatrist or psychiatric nurse practitioner, and 31.8% were started from an inpatient or residential facility.

**Medication Indications**

The targets of antipsychotic treatment were queried both in terms of target symptoms and diagnosis. Overall, aggression (62.9%) and mood instability (55.6%) were identified (by a wide margin) as the 2 primary target symptoms for which antipsychotic medications were being used (Table 2). The most common diagnoses were mood disorders (37.2%), which did not include bipolar disorder, and attention-deficit/hyperactivity disorder (32.0%).

**Other Treatments**

Other medications (e.g., stimulants, antidepressants) were commonly attempted before the use of antipsychotic agents. In only 5.4% of the cases were antipsychotic medications used as first-line pharmacologic treatment. Similarly,
antipsychotic medications were rarely initiated without previous nonpharmacologic interventions (1.2% of prescriptions), although in 14.6% of the cases, previous therapy was unknown. This rate rose to 29.6% when the prescriber reported that they were not the source who initiated the medication. Furthermore, the use of cognitive-behavioral therapy (CBT), which is 1 type of evidence-based treatment for many diagnoses such as anxiety, depression, and oppositional behavior, was used before an antipsychotic prescription in only 15.5% of cases.

Antipsychotic agents were seldom used as pharmacologic monotherapy (8.4%). Stimulants (45.3%), α-adrenergic agents (33.8%), and antidepressants (31.2%) were the most common co-occurring medications. In the majority of cases, nonpharmacologic treatment, such as psychotherapy or school-based interventions, were being used in addition to the medications, although CBT was again relatively uncommon (13.8%). Prescribers reported being unable to access any kind of counseling or psychotherapy at a rate of 2.1%.

Metabolic Monitoring

In 82.3% of prescriptions, metabolic monitoring, which at least included regular weight assessment, was being performed by the treating clinician or another provider. Regular laboratory evaluations, such as a fasting glucose and lipid profile, were less common at a self-reported rate of 57.2%. Performance of metabolic monitoring was more likely to occur in patients being treated by a psychiatrist versus a nonpsychiatrist (64.7% vs 43.4%; P < .001).

FDA and Best Practice Guidelines

Combining our items regarding patient age, specific medication used, and diagnosis, an antipsychotic prescription was found to follow a specific FDA indication in 27.2% of the cases. The difference between psychiatrists and nonpsychiatrists was not significant.

The indication for the antipsychotic medication was found to follow best practice guidelines in 91.7% of cases. The difference between psychiatrists (95.6%) and nonpsychiatrists (84.0%) was significant (P < .001). Combining this variable with the best practice criteria for age, number of antipsychotic medications, and metabolic monitoring, the overall rate of best practice prescribing was 50.1%, with the difference between psychiatrists (57.7%) and nonpsychiatrists (35.1%) being statistically significant (P < .001).

Lack of metabolic monitoring was the primary reason for a lack of adherence to best practice guidelines, as shown in Table 3. There was somewhat of a bimodal distribution in the percentage of cases that an individual clinician followed best practice guidelines, with providers often doing so most of the time or infrequently. From the logistic regression, the adjusted odds of a prescription written by a psychiatrist (compared with a nonpsychiatrist) adhering to best practice guidelines for the prescription of antipsychotic medications was 10.5 (95% confidence interval: 3.2–34.0; P < .0005), controlling for patient age, patient gender, and the total number of prescriptions written.

DISCUSSION

The present study examined the factors related to an antipsychotic medication prescription among Medicaid-insured youth in Vermont. We found that antipsychotic medication prescription followed overall best practice guidelines from the American Academy of Child and Adolescent Psychiatry 50.1% of the time, although adherence to indication was much higher at 91.7%. The medication met an FDA indication at a rate of 27.2%.

These statistics regarding FDA indications and best practice guidelines will likely be perceived by many as low. Unfortunately, the uniqueness of these data gives us few comparisons to additional studies in other populations across the United States. A report that compared antipsychotic medication use among youth across 16 states found a prevalence of 1.6% in 2007, which is similar to the 1.9% prevalence calculated for Vermont youth in 2011. Comparable medication rates, however, obviously cannot serve as a proxy to conclude that other factors related to antipsychotic medication prescribing would also be similar across different geographical regions.

This best practice percentage is likely somewhat of an overestimation due to the fact that the endorsement of regular metabolic monitoring, which was the element that most likely led to losing a best practice categorization, was according to self-report. In addition, our criteria for what constitutes a best practice indication were somewhat generous when the guidelines were less specific. Furthermore, in an attempt to keep the survey as brief as
possible, we did not include a question that queried each individual recommendation. At the same time, however, these data do not indicate that this class of medication is being used casually or in a “knee-jerk” manner for relatively low-level behaviors. The prescribing of antipsychotic medications to preschool-aged children in our sample was also almost nonexistent. Furthermore, our results show that when antipsychotic medications are being prescribed off-label or for non-first-line indications, they are given only after other medications and nonpharmacologic interventions have failed to offer improvement. Even in cases when the patient was diagnosed with a condition for which an antipsychotic medication is not a recommended first-line treatment (eg, oppositional defiant disorder), the target symptom was often a behavior such as physical aggression, in which there is some empirical data to support antipsychotic use. Finally, we found that nonpharmacologic approaches, such as some type of psychotherapy and school-based behavioral interventions, were attempted first the majority of the time.

Several specific findings deserve mention, as these highlight the possibility of actions that could be taken to improve the percentage of youth that are being prescribed medications according to best practice principles (should additional research confirm these results more broadly).

1. A large percentage of antipsychotic medications are being maintained by individuals who did not initiate them. These prescriptions are frequently originating from higher level treatment centers such as inpatient and residential services, who then return a patient to a primary care physician for follow-up. These physicians may not have the training and expertise of knowing if, when, and how to taper these medications once stability has been achieved. Improving access to child psychiatry consultation, and/or receiving training on the appropriate tapering of these medications, could reduce the number of children who continue to take antipsychotic medication indefinitely.

2. The extent to which other interventions have been tried before initiating antipsychotic medications is often unknown to the prescribing clinician. Being able to access information regarding past treatment quickly and reliably may be particularly challenging among children in state custody who often rapidly change settings and clinicians. An improved ability to obtain treatment history may help ensure that clinicians are fully aware of past treatment attempts.

3. Children taking antipsychotic medications infrequently received CBT either before the treatment with antipsychotic medications or currently with them. Evidence-based treatment of behaviors such as oppositionality and aggression have been shown to be effective in multiple research studies; however, the availability of clinicians trained in these techniques is frequently low, and non-psychiatrists especially may be unaware of the differing research base behind various types of child psychotherapy. Efforts aimed both at increasing the supply of therapists trained in evidence-based therapy and educating physicians about the relative effectiveness of various types of psychotherapy may help reduce unnecessary antipsychotic medication use.

4. Rates of metabolic monitoring, particularly with serial laboratory evaluations, were low. Laboratory results can identify times that antipsychotic medications should be considered for lowering or discontinuation. In our view, it also sends a clear signal to families that these are serious medications with serious potential adverse effects. As more practices switch over to an electronic medical record, it is possible that reminders to start and continue metabolic monitoring at recommended intervals could improve adherence to metabolic recommendations.

Our results indicate that best practice guidelines tend to be followed more frequently among psychiatrists (57.7%) as opposed to non-psychiatrists (35.1%). It is possible that psychiatrists are more aware than primary care clinicians of the metabolic recommendations regarding antipsychotic medications and thus were biased to report performing them. Nevertheless, the findings suggest that improving access to child psychiatry consultations for these patients could be 1 way to improve adherence to best practice guidelines.

Across the country, many states have undertaken initiatives designed to improve the prescribing of antipsychotic medication in an attempt to limit potential overuse. These initiatives have taken different forms and have included mandated reviews by child psychiatrists in Florida, judicial approval of

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**TABLE 3 Reasons for Nonadherence to Best Practice Guidelines**

<table>
<thead>
<tr>
<th>Reason for Best Practice Nonadherence</th>
<th>N (%)</th>
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<tbody>
<tr>
<td>Lack of laboratory evaluations for metabolic monitoring</td>
<td>216 (84.4)</td>
</tr>
<tr>
<td>(For non-first-line indications) previous psychotherapy not tried first</td>
<td>110 (66.3)</td>
</tr>
<tr>
<td>(For non-first-line indications) other type of medication not tried first</td>
<td>43 (26.1)</td>
</tr>
<tr>
<td>Not a first- or second-line indication</td>
<td>47 (16.3)</td>
</tr>
<tr>
<td>&gt;1 antipsychotic used</td>
<td>25 (9.5)</td>
</tr>
<tr>
<td>Age of patient &lt;5 years</td>
<td>2 (0.8)</td>
</tr>
</tbody>
</table>

*For individuals taking >1 antipsychotic medication, best practice guidelines were counted as adherent if principles were followed for all antipsychotic medications. More than 1 reason could apply per case and denominator changes according to item.*
antipsychotic medications for all youth in state custody in Massachusetts, increased use of prior authorization procedures, and efforts to improve phone and e-mail access to child psychiatry experts.8 In our own state, Medicaid claims data indicate that since 2009, the rate of children taking antipsychotic medications has dropped by 45% among children 6 to 12 years old and by 27% among children 13 to 17 years old (Department of Vermont Health Access, unpublished data). Bolstering confidence for the data from this survey is the fact that we were able to achieve a return rate of nearly 80%, which is much higher than what would have been obtained from a voluntary survey. Although our study had several strengths, there are also some limitations to consider. First, despite our efforts to gather data for informational purposes and not in a way that would be perceived as threatening or punitive, it is likely that some respondents completed the surveys in a manner that reflected their impression of what should be done rather than what was being done. Our self-reported rate of regular metabolic screening was higher than in studies that have relied on other means of assessing compliance, such as insurance claims.21,22 In addition, despite a relatively strong survey response rate of 80%, it is possible that those who did not reply differed from those that did in important ways. Finally, the survey was completed only for patients using Medicaid as their primary insurance and, thus, these results may not be generalizable to the general population and particularly those with private insurance. It is worth noting, however, that Medicaid eligibility in Vermont is inclusive relative to other states. Finally, the large number of prescriptions written by a small number of prescribers limits the generalizability of our findings.

CONCLUSIONS
This survey of prescribers of antipsychotic medications to Medicaid-insured youth in Vermont found that best practice guidelines leading to antipsychotic use were followed approximately one-half of the time, with a lack of regular metabolic monitoring being primarily responsible for noncompliance. Although treatment was often directed for non–FDA-indicated uses such as aggression and mood instability that accompanied disruptive behavioral and mood disorders, other types of both pharmacologic and nonpharmacologic treatments were usually tried before antipsychotic medications in the majority of cases. In addition, clinicians frequently found themselves taking over the care of patients prescribed antipsychotic medications by other providers. Improving education regarding appropriate tapering of antipsychotic medications, giving prescribers better access to patient’s treatment histories, increasing access to evidence-based psychotherapy, and expanding knowledge and tools to maximize recommended metabolic monitoring are among the interventions suggested by these survey results which could potentially ensure that antipsychotic medications are being used most safely and effectively.


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