

Adverse Events Medication Treatment Costs in a Chronically, Severely Mentally Ill Forensics Population

Alexandria L. Fagan¹, Julie Cold Kissack², Bruce G. Augustin³

Abstract

The adverse event profile of atypical antipsychotics continues to be delineated with the increased length of time the products have been on the market. Obesity, hypertension, dyslipidemia and diabetes appearing as new-onset comorbid diseases or exacerbated diseases in the mentally ill population have been reported following atypical antipsychotic exposure. Few reports in medical literature address the cost of treating atypical antipsychotic-induced adverse events. Nine patients on an inpatient forensics unit were enrolled in a longitudinal study monitoring adverse events with antipsychotic treatment. In this small case series report, adverse events were documented, and the cost of pharmacotherapeutic treatment cost, potentially, attributed to antipsychotic adverse events was calculated. The cost of pharmacotherapeutic treatment of adverse events caused by antipsychotics was substantial in this patient population. Failure to recognize the financial burden of this additional treatment may adversely impact treatment for the person with mental illness.

Key Words: Antipsychotic, Forensics, Metabolic Side Effects, Side Effects, Weight Gain

Introduction

Schizophrenia, a chronic, relapsing illness, occurs in about one percent of the worldwide population. Costs associated with this illness are extensive and are greater than costs associated with other psychiatric illnesses (1, 2). Inclusion of direct costs (e.g., hospitalization [3], medication [4],

comorbid states [5], etc.) and indirect costs (e.g., joblessness, criminal justice interaction, etc.) contributes to the financial burden associated with schizophrenia (6, 7). Antipsychotic treatment is the mainstay in managing symptoms in the person who suffers with schizophrenia. Atypical antipsychotics (AA) are more expensive than traditional antipsychotics, but medication costs are a small component of the total cost to treat schizophrenia. Few reports in medical literature address the cost of treating the AA-associated side effects in a forensics population.

As AA use has increased in patients with schizophrenia, concern for AA-induced adverse events has also risen. These adverse events, most predominantly weight gain and sequelae, contribute to increased morbidity and mortality. Based on the Framingham Heart Study data, Fontaine et al. (8) estimated that while clozapine may decrease suicidal behavior in 492 of 100,000 schizophrenia patients over ten years, the

¹ Mercer University College of Pharmacy and Health Sciences, Atlanta, GA

² Harding University College of Pharmacy, Searcy, AK

³ Georgia Regional Hospital at Atlanta, GA

Address for correspondence: Julie Cold Kissack, PharmD, BCPP, Professor, Chair, Pharmacy Practice, Harding University College of Pharmacy, 915 E. Market Avenue, Box 12230, Searcy, AR 72149-2230
Phone: 501-279-5562; Fax: 501-279-5525;
E-mail: jkissack@harding.edu

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weight gain induced by clozapine would be expected to result in 416 additional deaths. The incidence of comorbid disorders exacerbated by AA-induced weight gain, such as hypertension, diabetes, dyslipidemia and metabolic syndrome, significantly increases the cost of patient care.

Controversy exists as to whether first- or second-generation antipsychotics are more cost effective than traditional antipsychotics (9, 10). Polsky et al. (10) reviewed eight studies examining the cost effectiveness of AA versus traditional antipsychotics. Six of the eight studies reported that AA provided a cost benefit. Only one of these studies examined the effect of long-term adverse effects on the cost of care (10). Long-term adverse effects, such as diabetes, contribute significantly to healthcare costs. In 2002, the cost of diabetes care per patient was estimated to be \$5,642 (age adjusted) in healthcare expenditures (11). Despite the increased incidence of metabolic adverse events, some contend that AA may decrease overall care costs for patients with schizophrenia secondary to decreased hospitalization for psychopathology (12).

Bobes et al. (12) compared treatment costs for haloperidol, ziprasidone, olanzapine and risperidone. The highest cost attributed to adverse effects was associated with haloperidol, while ziprasidone required the least expenditure to treat adverse events. The main component of the attributable

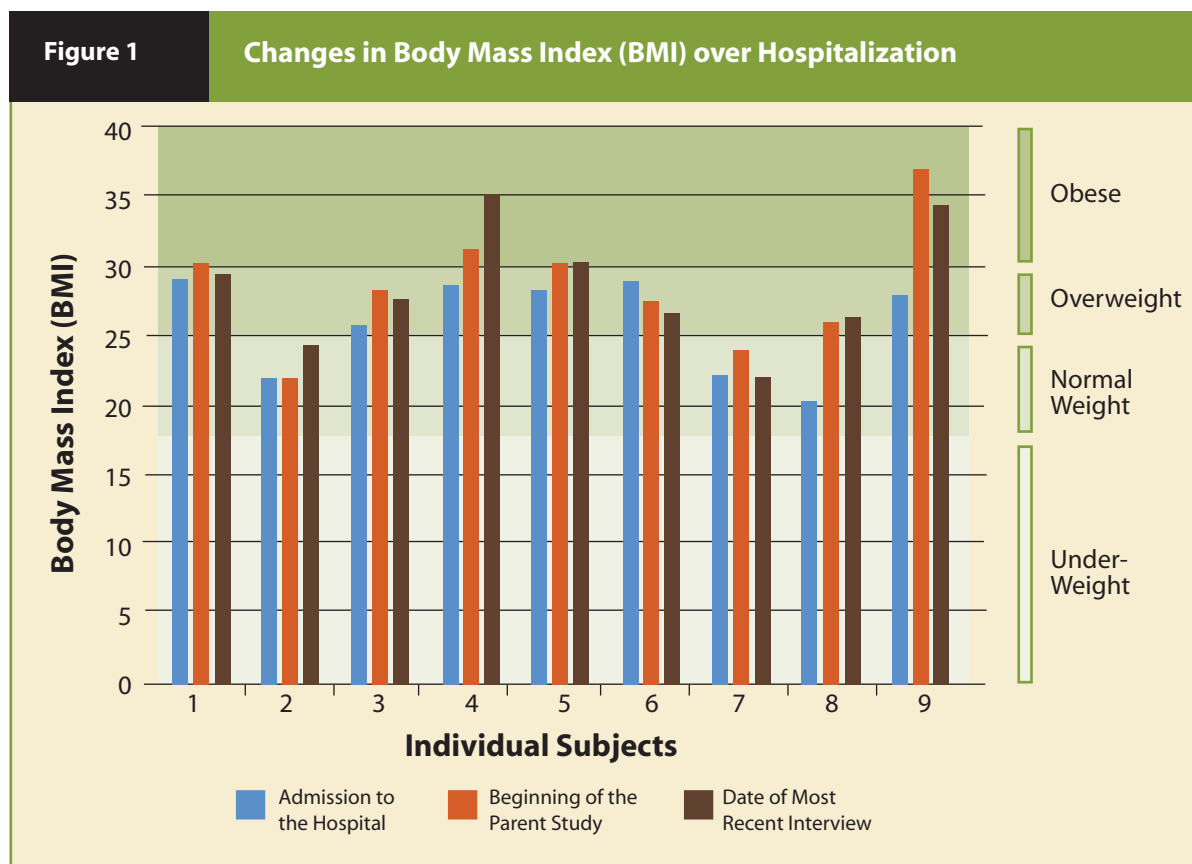
cost of adverse effects is hospitalization due to noncompliance initiated by a lack of tolerability (9). A financial evaluation of the medical care costs per patient with schizophrenia may identify a need to change antipsychotic treatment depending on the costs attributable to adverse events. This type of financial information may prove useful to guarantors such as insurers, public health organizations, or the patient. However, limited data about the actual adverse effect cost associated with antipsychotics are available in the medical literature, thus making this option less than viable.

A prospective, longitudinal, observational study (i.e., parent study) evaluating efficacy and effectiveness of medication therapy in a forensics population at a state psychiatric hospital was ongoing at the time that this add-on project was conducted. The purpose of this add-on study (i.e., current study) was to monitor antipsychotic-induced adverse events and calculate associated medication treatment costs in an inpatient forensic population.

Methods

This study was approved by the Georgia Department of Human Resources and Mercer University Institutional Review Boards. Informed consent from patients was obtained prior to study implementation. The treating physician verified the patient's competency to consent.

Table 1		Length of Stay and Body Mass Index (BMI) at Several Points since Admission			
Patient Gender	Length of Stay (Years)	BMI at Admission	BMI at Initiation of Parent Study (Days since Admission)	BMI on Most Recent Interview Date (Days since Parent Study Entry to Most Recent Interview)	Antipsychotic Medication
M	7	29.3	30.6 (2,353)	29.5 (222)	Chlorpromazine Olanzapine
M	1-1/2	21.8	21.8 (188)	24.3 (351)	Risperidone
M	7	25.7	28.4 (2,261)	27.6 (167)	Olanzapine
M	3	28.8	31.5 (1,032)	34.9 (88)	Aripiprazole
M	10	28.4	30.5 (3,469)	30.5 (0)	Olanzapine
M	2	29.1	27.6 (469)	26.6 (262)	Aripiprazole
F	1-1/2	22.3	24.1 (330)	22.3 (126)	Quetiapine
F	3	20.5	26.1 (938)	26.5 (89)	Risperidone
F	2	27.9	37.1 (358)	34.7 (263)	Quetiapine



All patients resided at an inpatient forensic unit in a state psychiatric facility and were adjudicated not guilty by reason of insanity (NGRI) for a variety of criminal offenses. A psychiatric pharmacist accompanied by a student pharmacist interviewed patients and completed side effect monitoring tool assessments during a summer research program. Demographics and weight changes were documented from the chart. Data from the current study were compared to the data captured at the parent study initiation and at hospital admission. Costs associated with antipsychotic therapy and pharmacotherapeutic treatment of antipsychotic-induced adverse events were assessed using the formulary costs in 2005 when the study was completed.

Results

Six males with a mean age of 42.2 ± 14.7 years and three females with a mean age of 35.7 ± 11.2 years had been hospitalized for an average of 4.1 years (range 1.5–10 years) prior to study entry. Ethnic background of the study sample was diverse (e.g., African American=5, Caucasian=3, Asian=1).

Four patients with neuromuscular adverse events (NAEs) had a longer average length of stay (i.e., 6.5 years) than those who had no NAEs. All patients with NAEs received monotherapy antipsychotic treatment. One patient exhibited clinically significant tardive dyskinesia while

receiving olanzapine, and three patients exhibited clinically significant extrapyramidal symptoms while receiving aripiprazole, risperidone or olanzapine.

Weight fluctuations were more prevalent than NAEs. At hospital admission, six patients were overweight (e.g., body mass index [BMI] 25 to 29.9). Seven patients gained $\geq 5\%$ of baseline weight from admission to the last interview date of the current study (see Table 1 and Figure 1). The average weight gain during this time period for the patients who gained weight was 29.2 ± 14.2 lbs (13.3 ± 6.5 kg), while the average weight loss for patients who lost weight was significantly less (9.0 lbs [4.1 kg]). Average gained weight in three patients from parent study entrance until the last interview date of the current study was still significant (i.e., 15.7 ± 8.5 lbs [7.1 ± 3.9 kg]). Average weight loss in five patients from parent study initiation until the final interview of the current study averaged 9.3 ± 4.3 lbs (4.2 ± 2.0 kg). At the conclusion of the current study, four patients were overweight and three were obese. Average blood glucose at admission was 104.6 mg/dl. Two patients throughout the entire study period had fasting and nonfasting blood glucose levels above 100 mg/dl.

The average monthly cost of the AA regimens varied depending upon the agent (see Table 2), as did the cost of medications used to treat adverse events, including gastro-

Table 2		Average Monthly Medication Costs*			
Antipsychotic Medication and Average Dose (±SD)	Antipsychotic (±SD)	GI[†] (±SD)	Metabolic and CV[‡] (±SD)	Anti-Cholinergics (±SD)	Total Medication Cost (±SD) to Treat Adverse Events
Aripiprazole (Abilify) 17.5(±3.5) mg	\$327.00 (±55.80)	\$18.00 (±18.00)	\$207.00 (±207.00)	\$9.00 (±4.20)	\$234.00 (±193.20)
Chlorpromazine (Thorazine) 300 mg	\$19.50	\$359.70	\$149.40	\$48.00	\$557.10
Olanzapine (Zyprexa) 30(±10.0) mg	\$754.50 (±191.70)	\$167.00 (±136.80)	\$58.20 (±64.50)	\$19.20 (±17.10)	\$245.10 (±250.20)
Quetiapine (Seroquel) 550(±424.3) mg	\$328.80 (±196.80)	\$31.50 (±31.20)	\$7.20 (±6.90)	\$5.70 (±4.20)	\$44.40 (±42.90)
Risperidone (Risperdal) 5.5(±7.7) mg	\$358.35 (±180.30)	\$32.70 (±26.70)	\$0	\$4.80 (±2.40)	\$37.50 (±29.10)

* Cost reflects hospital pricing in 2005; cost is less than retail.
[†] GI=medications used to treat gastrointestinal adverse events.
[‡] CV=medications used to treat cardiovascular adverse events.

intestinal disturbances, metabolic and cardiovascular exacerbations, and NAEs. One patient received chlorpromazine and olanzapine, and the average monthly cost of this combination treatment was higher (i.e., \$546.60) than all monotherapy treatments except olanzapine. The cost of treating adverse events associated with chlorpromazine and olanzapine was \$557.10, which exceeded the cost of treating adverse events associated with other AA treatments.

Discussion

The majority of patients gained weight from hospital admission to the last assessment in this current study. This finding is consistent with the weight gain profile of atypical antipsychotics, as they contribute to weight gain, but not universally. Despite AA's reputation for reduced NAEs, NAEs occurred in approximately 50% of the study population. The results of the NAE evaluations were confounded by years of varied antipsychotic therapy (e.g., AA and traditional agents). The average length of stay for those patients with NAEs was 6.5 years, over which time several medication changes occurred for each patient.

The high incidence of weight gain associated with AA therapy must be addressed to prevent problems with nonadherence and subsequent health problems. Implementation of preventative measures is imperative. Avoiding weight gain is the recommended initial treatment for diabetes or insulin resistance (13, 14) and should be a primary man-

agement technique for those persons taking antipsychotics. Weight-loss interventions that should be discussed with the person taking antipsychotics can include nutritional counseling, a personal exercise program, and/or use of medications to promote weight loss (15).

Prescribing medications that are less likely to be associated with weight gain would also be beneficial if clinical signs and symptoms of the illness are controlled (16, 17). Current treatment guidelines suggest that if a patient gains ≥5% of his or her initial weight during therapy, the clinician should consider changing the AA (16). Efforts should be made to discontinue the offending agent prior to adding additional agents for metabolic side effects (16). Simply adding a medication to treat the adverse event may not be the best solution, as it contributes to overall cost and may generate additional adverse events (17). Switching to an antipsychotic agent associated with no weight gain or weight maintenance, such as ziprasidone or aripiprazole, provided psychiatric efficacy is maintained, is appropriate (16-20). A switch in antipsychotic therapy may be necessary in the presence of excessive adverse events and associated financial costs.

Conclusions

Scant information about adverse event costs associated with antipsychotic treatment in a forensics population is found in the medical literature. The calculated cost of antipsychotics and treating adverse events associated with an-

tipsychotic treatment proved to be substantial in this study population. This component of care for the patient with schizophrenia must be added to other costs when calculating total burden. However, the quantitative drug therapy costs provide only a one-dimensional view of total care costs for the person with mental illness. Adverse events, medication costs, medical health and psychiatric functioning all contribute to effective medication therapy management in the person being treated with an antipsychotic for a psychiatric illness.

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