

University of Kentucky

UKnowledge

Institute for Pharmaceutical Outcomes and
Policy Faculty Publications

Pharmaceutical Outcomes and Policy

2-27-2017

Quetiapine Misuse and Abuse: Is It an Atypical Paradigm of Drug Seeking Behavior?

Sean Hyungwoo Kim

University of Kentucky, sean.kim@uky.edu

Gayoung Lee

Johns Hopkins University

Eric Kim

University of Alabama, Birmingham

Hyejin Jung

University of Texas, El Paso

Jongwha Chang

University of Texas, El Paso, jchang@utep.edu

Follow this and additional works at: https://uknowledge.uky.edu/ipop_facpub



Part of the [Pharmacy Administration, Policy and Regulation Commons](#)

Right click to open a feedback form in a new tab to let us know how this document benefits you.

Repository Citation

Kim, Sean Hyungwoo; Lee, Gayoung; Kim, Eric; Jung, Hyejin; and Chang, Jongwha, "Quetiapine Misuse and Abuse: Is It an Atypical Paradigm of Drug Seeking Behavior?" (2017). *Institute for Pharmaceutical Outcomes and Policy Faculty Publications*. 1.

https://uknowledge.uky.edu/ipop_facpub/1

This Article is brought to you for free and open access by the Pharmaceutical Outcomes and Policy at UKnowledge. It has been accepted for inclusion in Institute for Pharmaceutical Outcomes and Policy Faculty Publications by an authorized administrator of UKnowledge. For more information, please contact UKnowledge@lsv.uky.edu.

Quetiapine Misuse and Abuse: Is It an Atypical Paradigm of Drug Seeking Behavior?

Digital Object Identifier (DOI)

<https://doi.org/10.4103/2279-042X.200987>

Notes/Citation Information

Published in *Journal of Research in Pharmacy Practice*, v. 6, issue 1, p. 12-15.

© 2017 Journal of Research in Pharmacy Practice

This is an open access article distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License](#), which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

Quetiapine Misuse and Abuse: Is it an Atypical Paradigm of Drug Seeking Behavior?

Sean Kim¹, Gayoung Lee², Eric Kim³, Hyejin Jung⁴, Jongwha Chang⁵

¹Institute of Pharmaceutical Outcomes and Policy, University of Kentucky, Lexington, Kentucky, USA

²Wolfe Harry Feinstone Department of Molecular Microbiology and Immunology, Johns Hopkins University, Baltimore, USA

³Department of Biology, University of Alabama, Birmingham, Alabama, USA

⁴Department of Social Work, University of Texas, El Paso, Texas, USA

⁵Department of Pharmacy Practice, University of Texas, El Paso, Texas, USA

Received: July 2016.

Accepted: November 2016.

ABSTRACT

Recent case reports in medical literatures suggest that more and more second-generation atypical antipsychotics (AAs) have been prescribed for off-label use; quetiapine (Brand name: Seroquel®) showed increase in its trend for off-label use. Little is known about the reasons behind this trend, although historical sedative and hypnotic prescription patterns suggest that despite relatively superior safety profiles of quetiapine (especially for movement disorders), it may be used for treating substance abuse disorder. In addition, recent studies have shown a strong potential for misuse and abuse (MUA) of quetiapine beyond Food and Drug Administration-approved indications. This includes drug-seeking behaviors, such as feigning symptoms, motivated by quetiapine and use of quetiapine in conjunction with alcohol. Quetiapine appears to be the most documented AA with street values bartered illicitly on the street. A recent report from the Drug Abuse Warning Network has shown a high prevalence of quetiapine-related emergency department visits involving MUA. Several other case studies have found that quetiapine causes seeking behaviors observed in substance use disorder. In fact, the majority of quetiapine MUA involved patients diagnosed with substance use disorder. In the absence of a definitive mechanism of action of quetiapine's reinforcing properties, it is imperative to gather robust evidence to support or refute increasing off-label use of AAs.

KEYWORDS: Abuse, atypical antipsychotics, misuse, Quetiapine

INTRODUCTION

Atypical antipsychotics (AAs), also known as second-generation antipsychotics, are a group of antipsychotic medications used to treat serious mental illness such as bipolar disorder, schizophrenia, and anxiety disorder.^[1] Currently, there are 11 commonly prescribed AA medications approved by the Food and Drug Administration (FDA): aripiprazole, asenapine, clozapine, iloperidone, lurasidone, olanzapine, olanzapine/fluoxetine, paliperidone, quetiapine, risperidone, and ziprasidone.^[1] Since the introduction of the first AA drug, clozapine, in the 1970s, the advent of AAs has provided new treatment options for patients with serious psychiatric conditions.^[2-4] AAs are often considered safer than typical antipsychotics, they are associated with a decreased risk of neuroleptic malignant syndrome and extrapyramidal symptoms such as tardive dyskinesia (a movement disorder), tremor, and dystonia (muscle spasm and contractions).^[1,5]

Recently, increasing off-label use of AAs outside FDA-approved indications has been evident.^[1] In 2013, the

Drug Utilization Sub-committee of Australian Department of Health showed evidence of antipsychotic use among people aged 20–59 for the treatment of conditions other than schizophrenia or bipolar disorder.^[6] In the same year, the National Prescribing Service identified issues with off-label use of antipsychotics as means of behavior control in people with dementia in residential aged-care and other specialized-care facilities.^[7]

A series of case reports of AA abuse was reported in literature more than a decade ago,^[8,9] and several studies documented quetiapine as the most commonly abused AA.^[10-13] Although off-label prescribing in psychiatry is a common practice, changing trends in AA off-label use and the associated risks need to be scrutinized due to a potential correlation between previous substance abuse history (i.e., schizophrenia or bipolar disorder) and likelihood of misusing and abusing

Address for correspondence:

Prof. Jongwha Chang, E-mail: jchang@utep.edu

Access this article online

Quick Response Code:



Website: www.jrpp.net

DOI: 10.4103/2279-042X.200987

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Kim S, Lee G, Kim E, Jung H, Chang J. Quetiapine misuse and abuse: Is it an atypical paradigm of drug seeking behavior?. J Res Pharm Pract 2017;6:12-5.

AAs.^[14,15] Use of AAs in patients with substance abuse has been noted where drug-seeking behaviors were observed in correctional facility settings.^[10] Quetiapine abuse may be more prevalent among prisoners since commonly abused drugs are not readily available due to limited pharmaceutical formulary.^[10]

Misuse and abuse (MUA) of pharmaceuticals is associated with medications that produce euphoria or other desirable effects such as relaxation or alertness.^[16] Therefore, AAs are not generally considered drugs of abuse. However, AAs are being used to either enhance the effects of illicit substances such as cocaine and marijuana or counter their adverse effects.^[17]

QUETIAPINE IN THE TREATMENT OF SUBSTANCE ABUSE

AAs are commonly prescribed to aid in treating withdrawal symptoms from abused substances (i.e., alcohol, cocaine, benzodiazepines, or opioids) while increasing abstinence. However, this treatment showed inconsistent evidence with varying degrees of success.^[18-22] Quetiapine decreased psychiatric symptoms such as sleeplessness and anxiety for alcoholic patients with comorbid conditions such as bipolar disorder or schizoaffective disorder when patients were provided with 300–800 mg/day for 16 weeks following detoxification treatment.^[14] One possible speculation is that quetiapine alleviated mood symptoms and anxiety associated with withdrawal symptoms.

It is interesting to note that when patients do not have comorbid psychiatric conditions, AAs used to treat substance abuse did not show any significant benefit versus placebo.^[1] One possible explanation is that high comorbidity rate is thought to originate from the common biological roots of schizophrenia and bipolar disorders. Dopamine sensitivity in schizophrenic patients was found to make them more susceptible to the rewarding effect of the substance.^[14]

QUETIAPINE OFF-LABEL USE

The use of AAs in clinical practice has extended beyond FDA-approved indications and off-label uses; there have been signs that corroborate the emergence of quetiapine as the most commonly abused AA.^[23] These signs include existence of street names and values in the black market, diversion in prisons and other institutionalized settings, users seeking drug by feigning symptoms, and reports of intravenous or intranasal use of the drug.^[16] Some street names include “Susie-Q,” “baby-heroin,” and “squirrel,” when used in conjunction with other drugs of abuse, combinations are referred to as Maq-ball (quetiapine + marijuana) or Q-ball (quetiapine + cocaine or heroin).^[10,13,24,25] Numerous early reports and case studies focused on illicit use in incarcerated populations, which are at high risk of quetiapine MUA.^[11-13] In most cases, MUA of AAs are shown to be associated with forensic settings such as incarceration, court-ordered hospitalization, or other oversight by the legal system. Numerous case reports and several systematic studies have shown that quetiapine MUA is not confined to penal

populations; it also occurs in other settings such as psychiatric inpatients, outpatients, and patients attending drug treatment clinics.^[14,25,26]

Although the magnitude of AA MUA is unclear, this emerging trend has gained recognition. Patients often misuse AAs in an attempt to self-medicate and ameliorate unpleasant symptoms of withdrawal. Substance abusers may take AAs to counteract the effects of the addicted agent. In addition, polydrug users who were prescribed numerous psychoactive drugs are associated with illegally obtaining quetiapine in combination with other drugs.^[27-29]

QUETIAPINE ABUSE AND ADVERSE HEALTH OUTCOMES

Quetiapine abuse is most frequently related to its sedative and anxiolytic characteristics.^[10] It is proposed that the motivation for quetiapine MUA is “self-medication” for symptoms of anxiety and sleep withdrawal rather than euphoric effects.^[14] Nationally representative data presented by a recent study of emergency department (ED) visits involving MUA of quetiapine further highlight this emerging trend. The Drug Abuse Warning Network (DAWN) has contributed evidence stating MUA of quetiapine is warranted.^[16] The study found that high frequency of quetiapine-related ED visits involving MUA occurs among the noninstitutionalized general population, suggesting the need for evaluating potential MUA of quetiapine by patients.^[16]

There is a growing concern within the medical community in regard to the potential harm from prescribing quetiapine for its off-label use as well as dependence potential. In addition, there have been a number of international high-profile court cases in the media regarding quetiapine-related death involving either drug-drug interactions or overdose.^[6,30] Little is known about the reasons for off-label prescribing, but a historical perspective of sedative and hypnotic prescribing trends may explain this escalating use. The transition from barbiturates from early to mid-20th century (1920–1950s) to benzodiazepines in the 1960s were mainly due to safety concerns.^[24,31] Benzodiazepines use became more prevalent, but there have been increasing safety concerns over benzodiazepines, in particular alprazolam.^[32] It is interesting to note that patients whose symptoms with insomnia may be able to benefit from sedating characteristic of second-generation antipsychotics. More importantly, long-term use of both benzodiazepines and barbiturates has shown dependence with withdrawal symptoms, tolerance, and drug-seeking behavior despite a maladaptive pattern of substance abuse.^[33] Quetiapine, on the other hand, poses very low dystonia and extrapyramidal side effects. Hence, it is predicted that this seemingly safer profile is what makes quetiapine a more attractive treatment option than other antipsychotics. However, some known side effects such as metabolic disturbances such as weight gain, diabetes, and dyslipidemia are prominent in second-generation AAs.^[34,35] Clozapine and olanzapine carry significantly higher risk than other AAs, whereas aripiprazole, lurasidone, and ziprasidone are associated with the lowest risk of metabolic disturbances.^[36-41]

DISCUSSION: PUBLIC HEALTH IMPLICATION

From a public health perspective, how does MUA of AAs pose a public health challenge? When AAs are used for recreational/self-medication purposes without medical supervision, there are negative health consequences as MUA poses health risks as well as ED visits.^[16] According to Mattson *et al.*, ED visits involving MUA of quetiapine accounted for 52% of visits due to any antipsychotics. In addition, the greatest contributor to ED visits was quetiapine where 62% of visits were due to second-generation AAs.^[33] These findings suggest the need for heightened vigilance on potential MUA of quetiapine as well as other AAs. In addition to personal health risks, quetiapine MUA may pose negative public health implications. Providing AAs to malingering individuals in forensic settings affects mental health budgets as well as our available public health resources. Injudicious prescription of quetiapine is a rising problem as health-care providers need to have tighter regulations and clinical guidelines to follow. There is a need to consider quetiapine as a potential candidate to be classified as a scheduled controlled substance if there are robust research findings in the future.^[27,42]

Tarasoff and Osti suggest that there is evidence for quetiapine being commonly diverted from prescribed users for its cash street value.^[29] Hence, clinicians need to be especially concerned about MUA when prescribing quetiapine to patients with comorbid mental health conditions for self-treating substance MUA as well as quetiapine's potential for abuse. Clinicians should be aware of the fact that patients who are looking out for quetiapine should pay close attention to potential substance abuse and dependence. This emerging public health problem merits continued surveillance and awareness on the part of prescribers and the public health community of the potential for misuse of AAs.^[16]

CONCLUSION

Quetiapine MUA is increasing due to the fact that clinicians are prescribing fewer benzodiazepines, barbiturates, and stimulant drugs because of their addictive characteristics.^[14] Quetiapine has its unique motivation for anxiolytic and sedative effects without dependence. However, several case studies have found that quetiapine causes seeking behaviors observed in substance use disorder in the absence of definitive mechanism of action of quetiapine's reinforcing properties. Therefore, it is imperative to gather robust evidence to support or refute increasing off-label use of AAs as well as dependence.

AUTHORS' CONTRIBUTION

Sean Kim was responsible for idea and draft writing for the manuscript. Gayoung Lee was responsible for literature search as well as draft writing for the manuscript. Eric Kim was responsible for formatting and editing the overall manuscript. Hyejin Jung was responsible for writing public health implication section. Jongwha Chang was responsible for the overall supervision of the editing, manuscript writing, as well as all the support for literature search and providing resources.

FINANCIAL SUPPORT AND SPONSORSHIP

Nil.

CONFLICTS OF INTEREST

There are no conflicts of interest.

REFERENCES

1. Agency for Healthcare Research and Quality Off-Label Use of Atypical Antipsychotics: An Update AHRQ Publication No. 11-EHC087-EF. Available from: http://www.effectivehealthcare.ahrq.gov/ehc/products/150/778/CER43_Off-LabelAntipsychotics_20110928.pdf. [Last retrieved on 2015 Oct 30].
2. Alexander GC, Gallagher SA, Mascola A, Moloney RM, Stafford RS. Increasing off-label use of antipsychotic medications in the United States, 1995-2008. *Pharmacoepidemiol Drug Saf* 2011;20:177-84.
3. McDonagh MS, Peterson K, Carson S, Fu R, Thakurta S. Drug Class Review: Atypical Antipsychotic Drugs. Update 3. Portland, Oregon: Center for Evidence- Based Policy, Oregon Health and Science University; 2008.
4. Rowe DL. Off-label prescription of quetiapine in psychiatric disorders. *Expert Rev Neurother* 2007;7:841-52.
5. Correll CU, Leucht S, Kane JM. Lower risk for tardive dyskinesia associated with second-generation antipsychotics: A systematic review of 1-year studies. *Am J Psychiatry* 2004;161:414-25.
6. Australian Government Department of Health. DUSC Review on the Utilization of Antipsychotics. August 2013. Available from: <http://www.pbs.gov.au/info/industry/listing/elements/pbac-meetings/psd/2013-08/antipsychotics>. [Last accessed on 2016 Dec 22].
7. Gustafsson M, Karlsson S, Lövhelm H. Inappropriate long-term use of antipsychotic drugs is common among people with dementia living in specialized care units. *BMC Pharmacol Toxicol* 2013;14:10.
8. George M, Haasz M, Coronado A, Salhanick S, Korbel L, Kitzmiller JP. Acute dyskinesia, myoclonus, and akathisia in an adolescent male abusing quetiapine via nasal insufflation: A case study. *BMC Pediatr* 2013;13:187.
9. Hussain MZ, Waheed W, Hussain S. Intravenous quetiapine abuse. *Am J Psychiatry* 2005;162:1755-6.
10. Pinta ER, Taylor RE. Quetiapine addiction? *Am J Psychiatry* 2007;164:174-5.
11. Caniato RN, Gundabawady A, Baune BT, Alvarenga M. Malingered psychotic symptoms and quetiapine abuse in a forensic setting. *J Forens Psychiatry Psychol* 2009;20:928-35.
12. Keltner NL, Vance DE. Biological perspectives incarcerated care and quetiapine abuse. *Perspect Psychiatr Care* 2008;44:202-6.
13. Pierre JM, Shnyder I, Wirshing DA, Wirshing WC. Intranasal quetiapine abuse. *Am J Psychiatry* 2004;161:1718.
14. Erdogan S. Quetiapine in substance use disorders, abuse and dependence possibility: A review. *Turk Psikiyatri Derg* 2010;21:167-75.
15. Haw C, Stubbs J. Off-label use of antipsychotics: Are we mad? *Expert Opin Drug Saf* 2007;6:533-45.
16. Mattson ME, Albright VA, Yoon J, Council CL. Emergency department visits involving misuse and abuse of the antipsychotic quetiapine: Results from Drug Abuse Warning Network (DAWN). *Subst Abuse* 2015;9:39-4.
17. Atypical Antipsychotics New Drugs of Abuse. Medscape. Dec 17, 2013 Available from: http://www.medscape.com/viewarticle/817961#vp_2 [Last accessed on 2015 Sep 13].

18. Ray LA, Heydari A, Zorick T. Quetiapine for the treatment of alcoholism: Scientific rationale and review of the literature. *Drug Alcohol Rev* 2010;29:568-75.
19. Pinkofsky HB, Hahn AM, Campbell FA, Rueda J, Daley DC, Douaihy AB. Reduction of opioid-withdrawal symptoms with quetiapine. *J Clin Psychiatry* 2005;66:1285-8.
20. Kennedy A, Wood AE, Saxon AJ, Malte C, Harvey M, Jurik J, *et al.* Quetiapine for the treatment of cocaine dependence: An open-label trial. *J Clin Psychopharmacol* 2008;28:221-4.
21. Potvin S, Stip E, Roy JY. The effect of quetiapine on cannabis use in 8 psychosis patients with drug dependency. *Can J Psychiatry* 2004;49:711.
22. Waters BM, Joshi KG. Intravenous quetiapine-cocaine use ("Q-ball"). *Am J Psychiatry* 2007;164:173-4.
23. Maglione M, Ruelaz Maher A, Hu J, Wang Z, Shanman R, Shekelle PG, *et al.* Off-Label Use of Atypical Antipsychotics: An Update. Comparative Effectiveness Review No. 43. (Prepared by the Southern California Evidence-based Practice Center under Contract No. HHSA290-2007-10062-1.) Rockville, MD: Agency for Healthcare Research and Quality; 2011. Available from: Available from: www.effectivehealthcare.ahrq.gov/reports/final.cfm. [Last accessed on 2015 Sep 13].
24. López-Muñoz F, Ucha-Udabe R, Alamo C. The history of barbiturates a century after their clinical introduction. *Neuropsychiatr Dis Treat* 2005;1:329-43.
25. Bogart GT, Ott CA. Abuse of second-generation antipsychotics: What prescribers need to know. *Curr Psychiatr* 2011;10:77-9.
26. McElwee P, Nielsen S, Lloyd B, Lubman D. The increasing rates of quetiapine overdose and the characteristics of patients: Is quetiapine becoming a drug of abuse? *Drug Alcohol Rev* 2010;29:50-1.
27. Fischer BA, Boggs DL. The role of antihistaminic effects in the misuse of quetiapine: A case report and review of the literature. *Neurosci Biobehav Rev* 2010;34:555-8.
28. Malekshahi T, Tioleco N, Ahmed N, Campbell AN, Haller D. Misuse of atypical antipsychotics in conjunction with alcohol and other drugs of abuse. *J Subst Abuse Treat* 2015;48:8-12.
29. Tarasoff G, Osti K. Black-market value of antipsychotics, antidepressants, and hypnotics in Las Vegas, Nevada. *Am J Psychiatry* 2007;164:350.
30. Brett J. Concerns about quetiapine. *Aust Prescr* 2015;38:95-7.
31. López-Muñoz F, Alamo C, García-García P. The discovery of chlordiazepoxide and the clinical introduction of benzodiazepines: Half a century of anxiolytic drugs. *J Anxiety Disord* 2011;25:554-62.
32. Brett J. Concerns about quetiapine. *Aust Prescr* 2015;38:95-7.
33. de Wit H, Griffiths RR. Testing the abuse liability of anxiolytic and hypnotic drugs in humans. *Drug Alcohol Depend* 1991;28:83-111.
34. American Diabetes Association; American Psychiatric Association; American Association of Clinical Endocrinologists; North American Association for the Study of Obesity. Consensus development conference on antipsychotic drugs and obesity and diabetes. *Diabetes Care* 2004;27:596-601.
35. Bobes J, Rejas J, García-García M, Rico-Villademoros F, García-Portilla MP, Fernández I, *et al.* Weight gain in patients with schizophrenia treated with risperidone, olanzapine, quetiapine or haloperidol: Results of the EIRE study. *Schizophr Res* 2003;62:77-88.
36. Leslie DL, Rosenheck RA. Incidence of newly diagnosed diabetes attributable to atypical antipsychotic medications. *Am J Psychiatry* 2004;161:1709-11.
37. Brooks JO 3rd, Chang HS, Krasnykh O. Metabolic risks in older adults receiving second-generation antipsychotic medication. *Curr Psychiatry Rep* 2009;11:33-40.
38. Komossa K, Rummel-Kluge C, Schmid F, Hunger H, Schwarz S, El-Sayeh HG, *et al.* Aripiprazole versus other atypical antipsychotics for schizophrenia. *Cochrane Database Syst Rev* 2009;(4):CD006569.
39. Latuda (Lurasidone) [Package Insert]. Sunovion Pharmaceuticals, Inc.; 2013. Available from: <http://www.latuda.com/LatudaPrescribingInformation.pdf>. [Last accessed on 2016 Dec 22].
40. Flanagan RJ, Ball RY. Gastrointestinal hypomotility: An under-recognised life-threatening adverse effect of clozapine. *Forensic Sci Int* 2011;206:e31-6.
41. Nielsen J, Graff C, Kanfers JK, Toft E, Taylor D, Meyer JM. Assessing QT interval prolongation and its associated risks with antipsychotics. *CNS Drugs* 2011;25:473-90.
42. Murphy D, Bailey K, Stone M, Wirshing WC. Addictive potential of quetiapine. *Am J Psychiatry* 2008;165:918.