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Drug Abuse Warning Network

The DAWN Report

May 1, 2013

Emergency Department Visits for Adverse Reactions Involving the Insomnia Medication Zolpidem

An estimated 50 to 70 million Americans suffer from chronic sleep disorders, which can affect performance on daily tasks and lead to negative health consequences.[1] Zolpidem is a medication approved by the U.S. Food and Drug Administration (FDA) for short-term treatment of insomnia and is the active ingredient in the drugs Ambien®, Ambien CR®, Edluar®, and Zolpimist®.[2,3,4,5]

Historically, the FDA has recommended that the dose of most drugs containing zolpidem should be reduced by half when prescribed for the elderly.[2,3,4,5] Despite this recommendation, studies have shown that older populations are often being prescribed the higher dose, which may increase adverse reactions.[6] In a January 2013 safety announcement, the FDA took further steps by requiring drug manufacturers to lower the recommended doses of medications containing zolpidem by half for females; similar action was recommended, although not required, for males.[7]

Patients typically use zolpidem to benefit from temporary sedative effects that aid them in attaining restful sleep. Adverse reactions have occurred, including daytime drowsiness, dizziness, hallucinations, behavioral changes (e.g., bizarre behavior and agitation), and complex behaviors such as sleepwalking and "sleep driving" (i.e., driving while not fully awake).[2,3,4,5,8] When zolpidem is combined with other drugs that depress the central nervous system—such as anti-anxiety medications (e.g., benzodiazepines), narcotic pain relievers, or alcohol—the sedative effects of zolpidem can be dangerously enhanced.[2,3,4,5] Tracking emergency department (ED) visits involving zolpidem can provide data to help health professionals and patients understand the health consequences of adverse reactions associated with the use of this drug and to consider appropriate safeguards.

The Drug Abuse Warning Network (DAWN) is a public health surveillance system that monitors drug-related ED visits in the United States. To be a DAWN case, an ED visit must have involved a drug,

IN BRIEF

- The number of zolpidem-related emergency department (ED) visits involving adverse reactions increased nearly 220 percent from 6,111 visits in 2005 to 19,487 visits in 2010
- Females accounted for two thirds (68 percent) of zolpidem-related ED visits involving adverse reactions in 2010
- Patients aged 45 or older represented about three quarters (74 percent) of zolpidem-related ED visits involving adverse reactions while those aged 65 or older represented about one third (32 percent) of such visits
- Half of visits (50 percent) involved other pharmaceuticals combined with zolpidem, including narcotic pain relievers (26 percent) and other anti-anxiety and insomnia medications (16 percent)

either as the direct cause of the visit or as a contributing factor. Data are collected on numerous illicit drugs, including cocaine, marijuana, heroin, and stimulants (e.g., amphetamines and methamphetamines) as well as pharmaceutical products, such as prescribed and over-the-counter medications. Data are also collected for visits involving alcohol combined with other drugs and, for patients aged 20 or younger, alcohol when it is the only substance involved in the visit. Adverse reactions, as defined by DAWN, include ED visits in which an adverse health consequence resulted when taking prescription drugs, over-the-counter medications, or dietary supplements as prescribed or recommended. A visit is not included in this category if an illicit drug was involved. This issue of *The DAWN Report* focuses on zolpidem-related ED visits involving adverse reactions in 2010 and trends between 2005 and 2010.

Trends in ED Visits

In 2010, there were 64,175 ED visits involving zolpidem, and an estimated 19,487 (30 percent) of these ED visits were attributed to adverse reactions. The number of zolpidem-related ED visits involving adverse reactions increased nearly 220 percent from 6,111 visits in 2005 to 19,487 visits in 2010 (Figure 1).

Demographic Characteristics

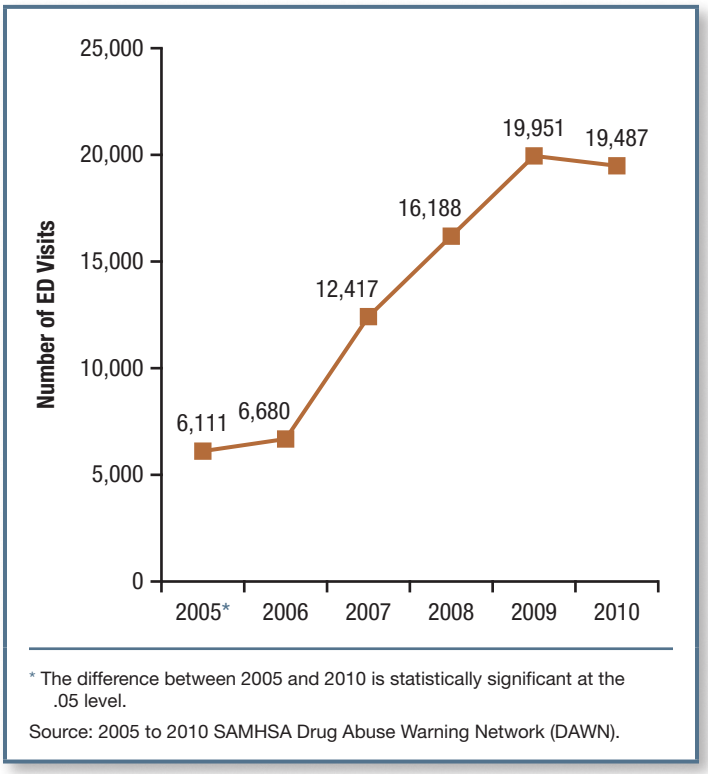
Zolpidem-related ED visits involving adverse reactions fluctuated for both males and females from 2005 to 2010; however, such visits increased overall by 274 percent among females (from 3,527 visits in 2005 to 13,180 visits in 2010) and by 144 percent among males (from 2,584 visits in 2005 to 6,306 visits in 2010) (Figure 2). Females accounted for two thirds (68 percent) of such visits in 2010, although prior years did not always show the same gender pattern. When comparing males to females, females had more zolpidem-related ED visits in 2007, 2009, and 2010.

In 2010, slightly more than half of ED visits involving adverse reactions to any drug were made by adults aged 45 years or older (1,306,460 visits, or 56 percent). In comparison, adults in this age group made about three quarters of zolpidem-related visits involving adverse reactions (14,429 visits, or 74 percent). More specifically, of the age groups included in this analysis, patients aged 65 or older represented the largest proportion of zolpidem-related ED visits involving adverse reactions (32 percent), followed by patients aged 45 to 54 (22 percent) (Figure 3).

Drug Combinations Involved in ED Visits

Among zolpidem-related ED visits involving adverse reactions in 2010, 40 percent involved zolpidem only (7,792 visits) (Table 1). Half of visits (50 percent) involved other pharmaceuticals combined with zolpidem, with approximately 46 percent involving other pharmaceuticals only. Narcotic pain relievers were commonly combined with zolpidem (4,168 visits, or 21 percent), as were other anti-anxiety and insomnia medications (3,111 visits, or 16 percent). In one tenth (1,970 visits, or 10 percent) of visits, alcohol was the only substance combined with zolpidem.

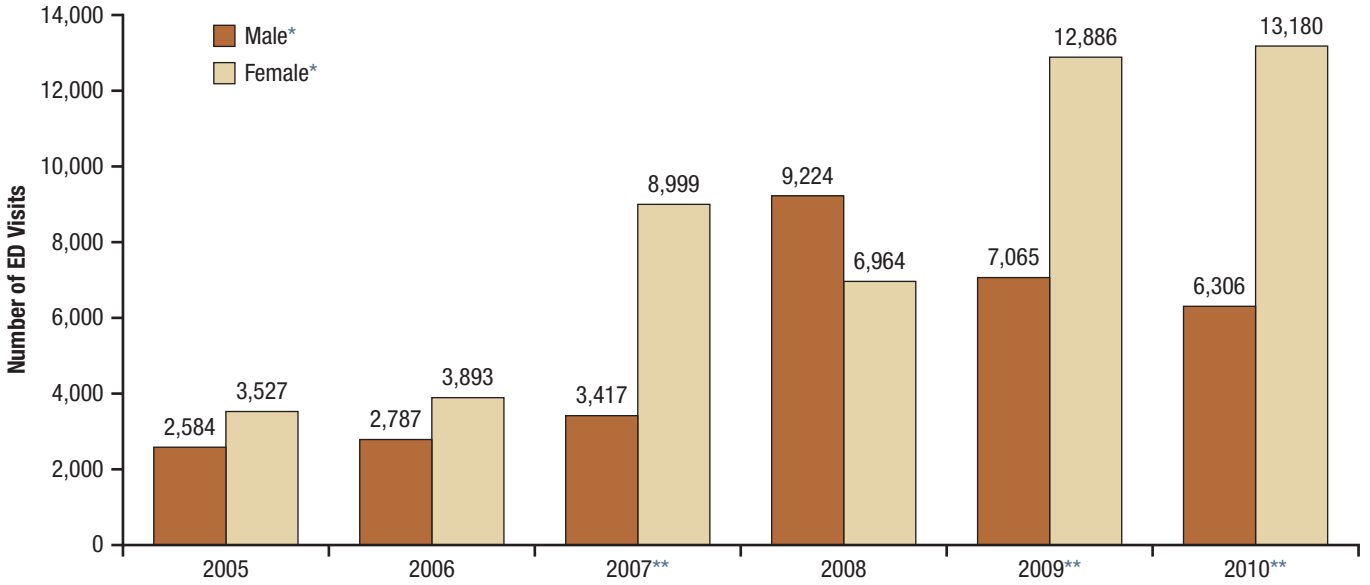
Figure 1. Zolpidem-Related Emergency Department (ED) Visits Involving Adverse Reactions, by Year: 2005 to 2010



* The difference between 2005 and 2010 is statistically significant at the .05 level.

Source: 2005 to 2010 SAMHSA Drug Abuse Warning Network (DAWN).

Figure 2. Zolpidem-Related Emergency Department (ED) Visits Involving Adverse Reactions, by Year and Gender: 2005 to 2010

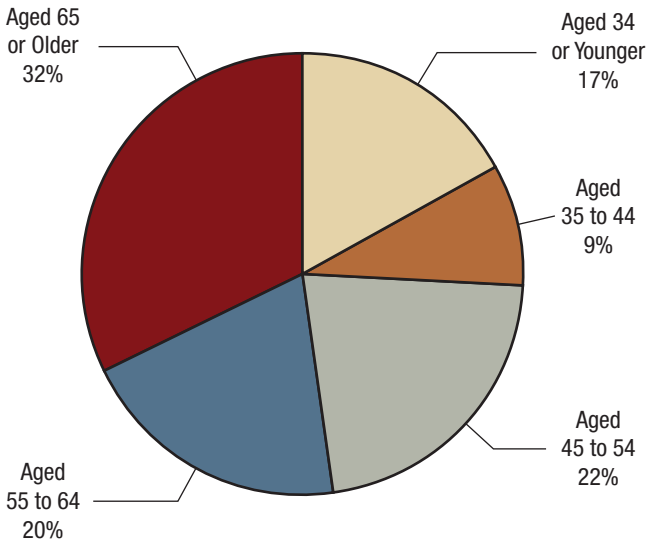


* The difference between 2005 and 2010 is statistically significant at the .05 level.

** The difference between males and females is statistically significant at the .05 level.

Source: 2005 to 2010 SAMHSA Drug Abuse Warning Network (DAWN).

Figure 3. Age Distribution among Zolpidem-Related Emergency Department (ED) Visits Involving Adverse Reactions: 2010



Source: 2010 SAMHSA Drug Abuse Warning Network (DAWN).

Table 1. Selected Drug Combinations among Zolpidem-Related Emergency Department (ED) Visits Involving Adverse Reactions: 2010

Drug Category/Combination	Number of ED Visits*	Percentage of Visits*
Total ED Visits	**19,487**	**100**
Zolpidem Only	7,792	40
In Combination with Other Pharmaceuticals	9,725	50
Pain Relievers	5,161	26
Narcotic Pain Relievers	4,168	21
Hydrocodone Combinations	2,813	14
Oxycodone Combinations	807	4
Antidepressants	3,612	19
Other Anti-anxiety and Insomnia Medications	3,111	16
Benzodiazepines	2,805	14
Anticonvulsants	2,461	13
Cardiovascular Medications	2,276	12
Hormones	2,010	10
Antipsychotics	1,589	8
Muscle Relaxants	1,194	6
In Combination with Other Pharmaceuticals Only	8,943	46
In Combination with Alcohol Only	1,970	10

* Because multiple drugs may be involved in each visit, estimates of visits by drug may add to more than the total, and percentages may add to more than 100 percent.

Source: 2010 SAMHSA Drug Abuse Warning Network (DAWN).

Discussion

Zolpidem is a widely prescribed medication approved by the FDA for the short-term treatment of insomnia. Females and the elderly are two populations that have been found to be more sensitive to the effects of zolpidem.[6,7] This pattern was reflected in ED visits occurring in 2010, in which a majority of zolpidem-related visits involving adverse reactions were made by females and about one in three were made by adults aged 65 or older.

Data presented here underscore the critical importance of continued surveillance for adverse reactions to all drugs to evaluate drug safety. Enhancing drug safety is an important step toward improving public health and reducing health care costs. Patients can help prevent adverse reactions by informing physicians, nurses, and mental health professionals of all medications, supplements, vitamins, and the dosages that they take and by making sure that any medical records are shared with all physicians, including specialists. Patients can safeguard against adverse reactions by using one pharmacy for all prescriptions and by advising their pharmacy of previous adverse reactions to any medications.[9] In addition, physicians and pharmacists can emphasize the importance of using zolpidem safely and only for short-term problems with insomnia.[2,3,4,5] This may be especially crucial for older adults, for whom insomnia is a common complaint and who often take other prescription medications that may interact with zolpidem.[6]

End Notes

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The Drug Abuse Warning Network (DAWN) is a public health surveillance system that monitors drug-related morbidity and mortality. DAWN uses a probability sample of hospitals to produce estimates of drug-related emergency department (ED) visits for the United States and selected metropolitan areas annually. DAWN also produces annual profiles of drug-related deaths reviewed by medical examiners or coroners in selected metropolitan areas and States.

Any ED visit related to recent drug use is included in DAWN. All types of drugs—licit and illicit—are covered. Alcohol involvement is documented for patients of all ages if it occurs with another drug. Alcohol is considered an illicit drug for minors and is documented even if no other drug is involved. The classification of drugs used in DAWN is derived from the Multum *Lexicon*, copyright 2012 Lexi-Comp, Inc., and/or Cerner Multum, Inc. The Multum Licensing Agreement governing use of the *Lexicon* can be found at http://www.samhsa.gov/data/DAWN.aspx.

DAWN is one of three major surveys conducted by the Substance Abuse and Mental Health Services Administration's Center for Behavioral Health Statistics and Quality (SAMHSA/CBHSQ). For more information on other CBHSQ surveys, go to http://www.samhsa.gov/data/. SAMHSA has contracts with Westat (Rockville, MD) and RTI International (Research Triangle Park, NC) to operate the DAWN system and produce publications.

For publications and additional information about DAWN, go to http://www.samhsa.gov/data/DAWN.aspx.

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