Lorazepam Versus Diazepam in the Management of Emergency Department Patients With Alcohol Withdrawal

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Study objective: Alcohol withdrawal is a common emergency department (ED) presentation. Although benzodiazepines reduce symptoms of withdrawal, there is little ED-based evidence to assist clinicians in selecting appropriate pharmacotherapy. We compare lorazepam with diazepam for the management of alcohol withdrawal to assess 1-week ED and hospital-related outcomes.

Methods: From January 1, 2015, to December 31, 2018, at 3 urban EDs in Vancouver, Canada, we studied patients with a discharge diagnosis of alcohol withdrawal. We excluded individuals presenting with a seizure or an acute concurrent illness. We performed a structured chart review to ascertain demographics, ED treatments, and outcomes. Patients were stratified according to initial management with lorazepam versus diazepam. The primary outcome was hospital admission, and secondary outcomes included in-ED seizures and 1-week return visits for discharged patients.

Results: Of 1,055 patients who presented with acute alcohol withdrawal, 898 were treated with benzodiazepines. Median age was 47 years (interquartile range 37 to 56 years) and 73% were men. Baseline characteristics were similar in the 2 groups. Overall, 69 of 394 patients (17.5%) receiving lorazepam were admitted to the hospital compared with 94 of 504 patients receiving diazepam (18.7%), a difference of 1.2% (95% confidence interval −4.2% to 6.3%). Seven patients (0.7%; 95% confidence interval 0.3% to 1.4%) had an in-ED seizure, but all seizures occurred before receipt of benzodiazepines. Among patients discharged home, 1-week return visits occurred for 78 of 325 (24.0%) who received lorazepam and 94 of 410 (23.2%) who received diazepam, a difference of 0.8% (95% confidence interval −5.3% to 7.1%).

Conclusion: In our sample of ED patients with acute alcohol withdrawal, patients receiving lorazepam had an admission rate similar to that of those receiving diazepam. The few in-ED seizures occurred before medication administration. For discharged patients, the 1-week ED return visit rate of nearly 25% could warrant enhanced follow-up and community support. [Ann Emerg Med. 2020;76:774-781.]

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INTRODUCTION

Alcohol use disorder is common, with up to 20% of the population meeting diagnostic criteria during their lifetime.[1] In 2016, 3 million deaths were attributable to alcohol worldwide, representing 5% of all deaths.[2] In the United States, emergency departments (EDs) had 4 million alcohol-related visits in 2011,[3] which has substantially increased during the past decade.[3,4]

It is estimated that approximately half of patients with an alcohol use disorder will experience symptoms of withdrawal after cessation or a decrease of alcohol intake,[5] and such patients may attend the ED for treatment of their symptoms. The spectrum of withdrawal ranges from insomnia and anxiety to hallucinations, seizures, delirium tremens, and death.[6,7] Despite this common, serious disorder, most ED-based research has focused on managing severe alcohol withdrawal, especially seizure prevention, with most studies conducted in a single center with fewer than 300 patients.[8-15] Outcomes such as admission rate, in-ED seizures, ED length of stay, and postdischarge events have not been consistently reported.

Benzodiazepines are the mainstay of treatment for alcohol withdrawal and prevent development of seizures and other complications.[5-7] The 2 most commonly

Editor's Capsule Summary

What is already known on this topic

Alcohol withdrawal is a common emergency department (ED) presentation. There is little ED-based evidence to assist clinicians in selecting appropriate benzodiazepine pharmacotherapy.

What question this study addressed

Is lorazepam or diazepam associated with lower admission rates or return ED visits?

What this study adds to our knowledge

For 1,055 patients presenting with acute alcohol withdrawal, lorazepam and diazepam were associated with similar rates of admission (≈19%) and 1-week return visits (≈23%).

How this is relevant to clinical practice

Although many emergency physicians have a favorite benzodiazepine to treat withdrawal seizures, this study suggests there is little difference in hospital admission or 1-week repeated ED visits.

administered benzodiazepines are lorazepam and diazepam, but they have been minimally compared, and emergency physicians have little evidence to guide their therapy. We hypothesized that admission rates, ED length of stay, and 1-week return visits and mortality would not be different for patients who received lorazepam or diazepam.

MATERIALS AND METHODS

Setting

We conducted a retrospective medical record review at 3 urban EDs in the Vancouver Coastal Health Region, affiliated with the University of British Columbia. St Paul's Hospital is an urban site with 90,000 annual visits; many patients are underhoused and have substance use disorders. Lions Gate Hospital has 60,000 annual visits in a wealthy suburban community. Mount St Joseph's Hospital is located in proximity to a number of substance use treatment facilities and has 35,000 annual visits. At all sites, physicians have wide latitude in diagnostic testing, treatment, medical choices, and referral of patients, although consultant physicians decide on admission. The Clinical Instrument Withdrawal Assessment–Alcohol Revised (CIWA[16]) is typically used for management of alcohol withdrawal. Patients are generally discharged home if they can achieve a score less than 10 within 6 to 8 hours of attendance. The Providence Health Care and Vancouver Coastal Health Region research ethics boards approved this study as part of a larger analysis of regional ED patients with alcohol use.

Selection of Participants

Vancouver Coastal Health maintains a regional ED database that collects information about all visits: basic demographics, date and time, the unique British Columbia health number, triage codes, admission status, and discharge diagnoses. We collected data for consecutive patients from January 1, 2015, to December 31, 2018, with a primary or secondary discharge diagnosis of "alcohol withdrawal" (*International Classification of Diseases, Ninth Revision* code 291.8). Physicians are required to list at least one discharge diagnosis per encounter. We excluded patients who had a Canadian Emergency Department Information Systems triage code[17] of "seizure." Such patients are often unable to provide coherent histories, may undergo extensive investigations to rule out ominous pathologies, and therefore may not be recognized as having alcohol withdrawal. Furthermore, we excluded all patients with an underlying acute medical, psychiatric, or traumatic condition because that condition, rather than alcohol withdrawal, may have driven diagnostic testing, management, and disposition. We excluded non–British Columbia residents because they do not have a British Columbia health number and cannot be followed postdischarge. We also excluded return visits occurring within 1 week of the index ED encounter because these were considered outcomes rather than new index visits. We removed all information from this list except the British Columbia health number and date and time of encounter but kept a master list with outcomes, including admission status and ED length of stay.

Data Collection and Processing

St Paul's and Mount St Joseph's ED use Sunrise Clinical Manager (Allscripts, Atlanta, GA) and Lions Gate ED uses Cerner Millennium. (Cerner, Kansas City, MO). Both record patient demographics, all ED investigations and results, as well as ED and hospital discharge summaries. Using a random-number generator, we selected half of all patients for medical record review, using accepted criteria for medical record reviews.[18] We obtained data from 2 sources. First, demographics, triage code, initial vital signs, admission status, and ED length of stay were extracted directly from the respective hospital databases. Second, 3 medical students (I.S., A.Y., I.C.) and a senior resident (S.D.) abstracted vital signs, ED treatments including all medications (with doses and routes of administration), in-

ED seizures (along with the timing of medications), initial and final CIWA scores (which are collected by nurses at regular intervals), discharge medications or prescriptions, and 1-week all-cause ED revisits to any of the 3 sites. For admitted patients, we used the same chart review to abstract data on the hospital length of stay, ICU admission, and 1-week postdischarge all-cause return ED visits to any of the 3 sites.

The primary investigator trained abstractors on the first 20 charts and abstractors submitted data each week; they reviewed any discrepant data with the primary investigator. They examined electronic charts dating to 1999 to identify potentially missing historical data such as "previous seizure." Discrepant data were managed by assuming that consultant notes took priority over emergency physician notes, which took priority over nursing or triage notes. However, if a medication (name, dose, or timing), documentation of an in-ED seizure, or CIWA score was missing, such data could not be recovered and were not included. We anticipated that not all patients would have CIWA scores recorded. As a measure of data collection integrity, the primary investigator reviewed a random 10% of all charts and estimated interrater reliability for the key variable of previous seizure. Only the primary investigator was aware of which outcomes would be assessed but did not have access to either admission or length of stay data while the chart review was ongoing.

We anticipated that some patients with alcohol-related withdrawal seizures might be coded with only a discharge diagnosis of "seizure," which would thus underestimate the true number of both patients with alcohol withdrawal and those with alcohol-related seizures. To mitigate this concern, 2 staff emergency physicians, blinded to study purpose, hypothesis, and outcomes, independently reviewed a separate sample of ED patients from the same timeframe, hospitals, and database with a discharge diagnosis of seizure. The physicians assessed whether the patient had arrived with a seizure, whether he or she had an in-ED seizure, and whether the seizures were certainly, possibly, or not related to alcohol use. The size of the sample was 5% of the size of the alcohol withdrawal sample, both physicians assessed all charts, and we calculated overall agreement on each factor.

In addition, we asked data abstractors to identify all potential patients with an acute concurrent condition (for example, a gastrointestinal bleeding event or trauma that was evident at ED presentation; we did not include chronic issues such as stable dementia or issues that developed postadmission). We composed a list of these patients and 2 separate staff emergency physicians, blinded to study purpose, hypothesis, and outcomes, independently reviewed the ED and hospital charts of all patients to ascertain whether an acute concurrent illness was present. We measured overall agreement and the principal investigator adjudicated discrepancies.

We stratified patients into those who initially received lorazepam or those who initially received diazepam. The unit of analysis was the patient encounter. Some patients were anticipated to receive both lorazepam and diazepam, either because of patient preference or because the initial medication had a suboptimal effect; we collected the number of patients who required a rescue dose of an alternative benzodiazepine after the initial administration.

Outcome Measures

The prespecified primary outcome was hospital admission at the index ED visit. This was obtained from the master data list that had been subjected to blinding during medical record review. Secondary outcomes included in-ED seizures and ED length of stay for nonadmitted patients. In-ED seizures and timing of seizure medications were ascertained from the patient chart and verified by a second independent assessor. ED length of stay was obtained directly from the hospital database. For ED revisits, we did not attempt to distinguish between apparently alcohol- and nonalcohol-related revisits because complications of alcohol misuse are diverse and can lead to nearly any diagnosis. The British Columbia vital statistics database records all deaths in the province, and these are indicated within 2 weeks on the hospital databases; we collected 1-week mortality. For admitted patients, we included hospital length of stay, length of ICU admission, inhospital mortality, and 1-week postdischarge ED return visits and rehospitalizations, with the period starting the day of discharge.

Previous reports indicated an admission rate of approximately 20% to 30%[8-10,15] and we believed that our patients likely would not be as sick. We estimated a 20% admission rate and thought that a 10% absolute difference would be clinically relevant. Considering an α of .05 and a power of 80%, at least 293 patients were needed to receive each medication.

Primary Data Analysis

We used Microsoft Excel (version 2019; Microsoft, Redmond, WA) for data entry and R brms (version 2.11.0; R Foundation for Statistical Computing, Vienna, Austria) for analysis. We reported discrete variables as percentages. We presented continuous variables as means with SDs if normally distributed or medians with interquartile ranges (IQRs) otherwise. We used basic tests of comparison where appropriate. We stratified patients into those receiving

lorazepam versus diazepam and compared their probability of admission, ED length of stay, and probability of 1-week ED return (for discharged patients).

Because of the potential for between-site differences in management (including admission thresholds) and repeated visits for patients, we constructed a Bayesian hierarchic model accounting for these clusters.[19] We used a Bernoulli model for admission and 1-week ED return rates and a Gaussian model for ED length of stay. We estimated varying intercept terms for each of the clusters and included an interaction term with each patient's age and sex to adjust for the effects of these variables on the outcome. Because intravenous versus oral route of benzodiazepine administration has the potential to affect length of stay, we included route of administration in the model estimating ED length of stay. In lieu of significance testing, we report measures of association with 95% posterior intervals, which describe the uncertainty range compatible with 95% of patients. We provide a complete description of the methods used, prior distributions, and cluster estimates in Appendix E1 (available online at http://www.annemergmed.com).

RESULTS

There were a total of 2,446 visits with a discharge diagnosis of alcohol withdrawal during the study period. Of those, we collected 1,223 visits. Eighty-three (6.8%) had a triage code of seizure and 20 had an acute concurrent illness. (The 2 emergency physician adjudicators reviewed 31 potential patients and agreed in 26 [80.6%] cases.) This left 1,055 patients for chart review (Figure), with an interrater agreement for documented previous seizure of 0.85 (95% confidence interval [CI] 0.79 to 0.90).

Two separate emergency physicians reviewed a random sample of 61 charts of ED patients with discharge diagnosis of seizure. They found that 60 patients presented with a seizure and 4 had an in-ED seizure (100% reviewer agreement for both). In 5 of 61 cases, the seizure was attributed to alcohol withdrawal, and the reviewers agreed on 4 of the cases.

Table 1 shows baseline characteristics and ancillary treatments for the 898 patient encounters (534 unique patients) in which benzodiazepines were administered: 394 patients (44%) received lorazepam and 504 (56%) diazepam. There were no between-group differences in ambulance arrival, demographics, or initial vital signs. Nearly half the patients in both groups had attended an ED within the past month. Initial median CIWA scores were similar: 17 (IQR 13 to 22). A slightly greater proportion of patients received diazepam intravenously but fluid and antiemetic administration were similar.

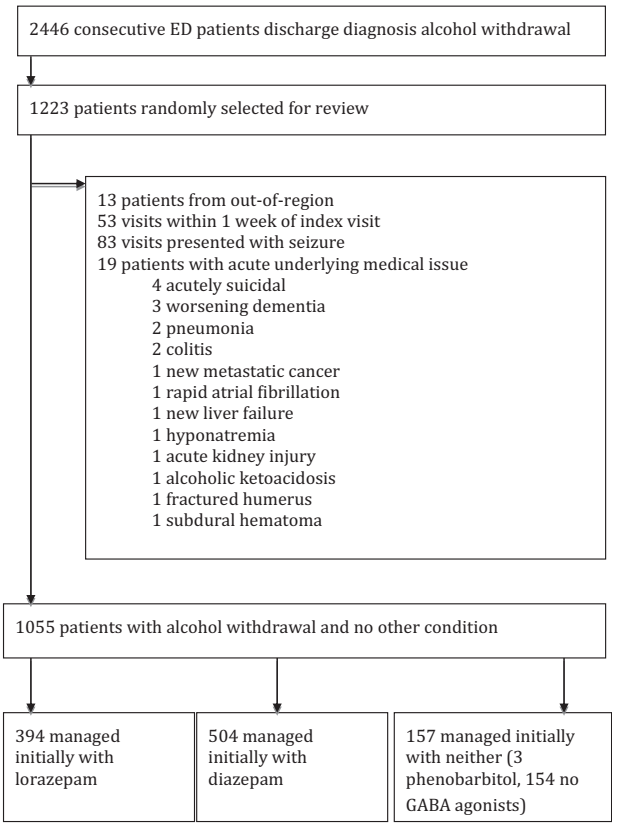

Figure. Study flow diagram.

Main Results

Overall, 69 of 394 patients (17.5%) receiving lorazepam were admitted compared with 94 of 504 patients (18.7%) receiving diazepam, a difference of 1.2% (95% CI –4.2% to 6.3%) (Table 2). After adjustment, the odds ratio for admission for a patient administered lorazepam compared with that for a patient administered diazepam was 0.74 (95% posterior interval 0.50 to 1.09). The probability that a patient administered lorazepam was less likely to be admitted than one administered diazepam was 0.90. Seven patients (0.7%; 95% CI 0.3% to 1.4%), all with previous seizures, had an ED seizure, with all occurring before receipt of benzodiazepines. Median ED length of stay was 266 minutes for patients receiving lorazepam versus 299 minutes for those receiving diazepam (Table 2). After adjustment, a patient administered lorazepam had a shorter length of stay (9.5 minutes; 95% posterior interval –24.8 to 5.9 minutes) compared with one administered diazepam. The probability that a patient administered lorazepam had shorter length of stay than one administered diazepam was 0.84.

One-week return visits were similar (lorazepam 78/394 [24.0%]; diazepam 95/504 [23.2%]), with 2 patients attending for a seizure-related complaint (Table 2). After

Table 1. Baseline variables of patients receiving lorazepam and diazepam.

Variable	Lorazepam (n=394)	Diazepam (n=504)	Difference (95% CI)
Demographics			
Age median (IQR), y	48 (37 to 57)	47 (36 to 56)	1 (−1 to 2)
Men	287 (72.9)	368 (73.1)	−0.2 (−5.8 to 6.2)
Ambulance arrival to ED	164 (41.6)	204 (40.5)	1.1 (−5.5 to 7.8)
No fixed address	54 (13.7)	71 (15.5)	−1.8 (−6.5 to 3.1)
≥1 ED visit in last 30 days	159 (40.4)	228 (45.2)	−4.9 (−11.5 to 0.2)
Initial ED vital signs, median (IQR)			
Pulse rate, beats/min	104 (90 to 117)	104 (91 to 118)	0 (−3 to 3)
Systolic blood pressure, mm Hg	145 (132 to 154)	140 (129 to 153)	5 (−1 to 8)
Diastolic blood pressure, mm Hg	84 (76 to 92)	83 (74 to 88)	1 (−1 to 3)
Respiratory rate, breaths/min	18 (18 to 18)	18 (18 to 18)	0 (0 to 0)
Oxygen level, % on room air	98 (97 to 99)	98 (97 to 99)	0 (0 to 0)
Temperature, °C	36.8 (36.7 to 36.9)	36.8 (36.7 to 36.9)	0 (0 to 0)
ED management			
Blood testing obtained	261 (66.2)	370 (73.4)	−7.2 (−13.4 to −1.0)
Alcohol level obtained	198 (50.3)	278 (55.2)	−4.9 (−11.6 to 1.9)
Alcohol level positive*	76 (19.3)	112 (22.2)	−2.9 (−8.3 to 2.6)
Computed tomography of the head obtained	13 (3.3)	22 (4.4)	−1.1 (−3.8 to 1.8)
Intravenous fluids	236 (60.0)	297 (58.9)	1.1 (−5.6 to 7.5)
Median volume fluids (IQR), L	1 (1 to 2)	1 (1 to 2)	0 (0 to 0)
Antiemetic provided	138 (35.0)	175 (34.7)	0.3 (−6.1 to 6.8)
Number of patients with CIWA	215 (54.6)	306 (60.7)	−6.1 (−12.8 to 0.6)
Median initial CIWA score (IQR)	17 (13 to 21)	17 (13 to 22)	0 (-1 to 0)
Benzodiazepine details			
Median total dose (IQR), mg	3 (2 to 6)	20 (10 to 40)	Not applicable
First dose intravenous	78 (19.8)	147 (29.2)	−9.3 (−15.0 to −3.5)
First dose oral or sublingual	316 (80.2)	357 (70.8)	9.3 (3.5 to 15.0)
Rescue benzodiazepine administered*	42 (10.7)	20 (4.0)	6.7 (3.2 to 10.6)

Data are presented as No. (%) unless otherwise indicated.
*"Alcohol level positive" is greater than 17 mmol/L; "rescue" denotes the other benzodiazepine was subsequently used.

adjustment, the odds ratio for ED return of a patient administered lorazepam compared with that of one administered diazepam was 1.0 (95% posterior interval 0.70 to 1.5). The probability that a patient provided lorazepam was more likely to return than one provided diazepam was 0.16. There was 1 death: a 27-year-old man with opioid and alcohol use disorders who received ED diazepam for withdrawal was discharged home with diazepam. He returned within 36 hours with an apparent exacerbation of his chronic abdominal pain, was treated with hydromorphone 2 mg intravenously, collapsed within minutes, and was found to have a cardiac arrest with a nonshockable rhythm; he was not resuscitated, and no autopsy was performed.

For admitted patients, median length of stay in both groups was 3 days, (IQR 2 to 5 days), 3 patients were admitted to the ICU (1 because of subsequent aspiration pneumonia on postadmission day 2 after receiving diazepam in the ED), and no patients died inhospital. Postdischarge 7-day return visits were nonsignificantly higher for patients initially administered lorazepam (23.2%) versus diazepam (16.9%) (Table 2).

One hundred fifty-seven patients did not receive benzodiazepines. (Three received phenobarbital.) The median age was 44 years (IQR 34 to 55 years) and they experienced less severe symptoms, with a median CIWA score of 13 (IQR 8 to 16). Seven patients (4.4%; 95% CI 2.0% to 9.3%) were admitted at the index visit, whereas 32 of 150 discharged patients (21.3%; 95% CI 15.2% to 29.0%) had a 1-week revisit.

Table 2. Outcomes for patients receiving lorazepam or diazepam.

Variable	Lorazepam (n=394)	Diazepam (n=504)	Difference (95% CI)
Had seizure in ED*	3 (0.8)	4 (0.8)	−0.03 (−1.7 to 1.5)
Admitted to hospital	69 (17.5)	94 (18.7)	−1.2 (−6.3 to 4.2)
Median hospital LOS, days (IQR)	3 (2 to 5)	3 (2 to 5)	0 (0 to 0)
Admitted to ICU	1 (0.3)	2† (0.4)	−0.1 (−1.6 to 1.3)
Died in hospital	0	0	0 (−1.2 to 0.9)
ED revisit within 7 days postdischarge	16 (23.2)	15 (16.0)	7.3 (−5.7 to 20.9)
Discharged home	325 (82.5)	410 (81.3)	1.2 (−4.2 to 6.3)
Median ED LOS (IQR), min	266 (163 to 387)	299 (192 to 463)	−33 (−75 to − 6)
Final CIWA score recorded	127 (38.5)	205 (50.0)	−11.5 (−18.8 to −4.1)
Median final CIWA score (IQR)	7 (5 to 11)	7 (4 to 10)	0 (−1 to 0)
Documented medications on discharge‡			
Lorazepam	173 (53.3)	25 (6.1)	47.1 (40.9 to 53.0)
Diazepam	29 (8.9)	223 (54.4)	−45.5 (−51.1 to 39.2)
Gabapentin	5 (1.5)	7 (1.7)	−0.2 (−2.3 to 2.3)
Total	207 (63.7)	255 (62.2)	1.5 (−5.8 to 8.6)
ED return visit in 7 days	78 (24.0)	95 (23.2)	0.8 (−5.3 to 7.1)
Hospital admission in 7 days	10 (3.0)	15 (3.7)	−0.7 (−3.5 to 2.5)
Died within 7 days	0	1 (0.2)	−0.2 (−1.3 to 1.0)

LOS, Length of stay.
Data are presented as No. (%) unless otherwise indicated.
*All seizures took place before medication administration.
†One admission for aspiration pneumonia.
‡Either documented medications at discharge or documented prescription. For lorazepam, 4×2 mg on the first day and 4×1 mg on the second day; for diazepam, 4×10 mg on the first day and 4×5 mg on the second day.

LIMITATIONS

This study was undertaken at 3 EDs in a single urban Canadian health region. Alcohol withdrawal is a clinical diagnosis and the lack of a confirmatory test ensures that we cannot be confident that each patient actually had the condition. As a corollary, patients who had nonspecific diagnoses such as anxiety or nausea could have had unappreciated alcohol withdrawal and not been included because of lack of coding by attending physicians. Our separate assessment of patients with a discharge diagnoses of seizure indicates that few patients with alcohol withdrawal seizures were miscoded as seizure alone and thus not identified in our alcohol withdrawal cohort. Undocumented factors such as outpatient medication use, additional community treatment (or lack thereof), or previous detoxification efforts were inconsistently documented, and we do not report these, but it is unclear whether there is a systematic bias. Admission is an imperfect metric for assessing medication effectiveness and may depend on many other factors, including coincident substance use issues, mental health concerns, or precarious social circumstances. Emergency physicians supplied home benzodiazepines according to a regular tapering dose, and these may not have been consistently recorded, especially if a consultant discharged the patient, but it is unlikely that documentation deficiencies would occur disproportionately in one group. Our combined 18% admission rate is less than described in other studies[8,9,14] and only 3 patients required ICU admission. This is a descriptive analysis and only associations can be developed.

DISCUSSION

In our sample of ED patients with acute alcohol withdrawal, those receiving diazepam or lorazepam had similar proportions of hospitalization and 1-week ED return visits. After multivariable adjustment to account for site and patient clustering, odds ratios demonstrated no significant differences. Previous ED-based studies have typically been conducted at a single center with fewer than 300 patients, with uncertain data collection standards, and have typically focused on the sickest patients.[8-10,12-15] Our findings assist clinicians by providing a data-driven comparison regarding comparative effectiveness of these common benzodiazepines, as well as in-ED seizure rates and post-ED outcomes for both admitted and discharged patients. In a recent review, Long et al[20] stated, "Both [lorazepam and diazepam] are efficacious in treating withdrawal. Provider choice…will likely depend on

comfort with the medication and institution," and our results support this view.

It is critical to understand that recent recommendations[2,21] de-emphasize the role of benzodiazepines in the management of patients with milder alcohol withdrawal and encourage their use only in patients at high risk of seizure or delirium. As such, it is likely that benzodiazepines were administered to some ED patients who were at low risk of serious sequelae. There are currently no ED-based recommendations or ED-based scoring systems for assessing whether patients are at risk of deterioration, and given that histories may be challenging to elicit, it is likely that many of our physicians assumed patients were at high risk of serious events. Likewise, contemporary strategies of emergency physicians managing patients with mild to moderate alcohol withdrawal are unclear.[20]

Seven patients, all with a history of seizures, had an in-ED seizure, and all occurred before benzodiazepine administration. Our ED seizure rate is less than that described by Kahan et al[8] (8/209; 3.8%), although it is unclear whether their patients had seizures before or after treatment. Although in-ED seizures do not appear common, such events have considerable morbidity, and EDs should consider strategies to mitigate such events.

Because the majority of ED-based studies have focused on in-ED or inhospital treatments to minimize severe complications or seizures, postdischarge outcomes have been minimally reported.[11] In our cohort, nearly one quarter of patient encounters resulted in a 1-week return ED visit, although it is unclear whether such visits were directly related to alcohol use. Given that patients may have consulted other primary care physicians or attended other EDs, walk-in or urgent care clinics, addictions clinics, or detoxification centers, our findings substantially underestimate the hazards and financial cost of alcohol use disorder. Although our findings may differ from those of other settings, these results suggest that patients with alcohol withdrawal face a substantial care gap. Furthermore, nearly one fifth of patients reattend an ED within 1 week of multiday admissions, suggesting that even hospitalization does not mitigate short-term morbidity. Combined with the finding that half of patients visited an ED in the preceding 30 days, our data indicate that ED patients who attend for alcohol withdrawal may require more intense community-based support than currently exists.

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Author contributions: FS conceived the study. FS, EG, and GI designed the study. EG provided the initial data set. FS, IS, SD, AY, and IC collected data. AK and DB adjudicated seizure patients. BG and EG reviewed patients with acute concurrent issues. FS and BG performed basic statistical analysis. DL provided Bayesian analysis. JM and AS provided content information from a public health viewpoint. IM, SN, and LT provided substantial assistance from an addictions viewpoint. FS drafted the article and all authors approved it. FS takes responsibility for the paper as a whole.

All authors attest to meeting the four ICMJE.org authorship criteria: (1) Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND (2) Drafting the work or revising it critically for important intellectual content; AND (3) Final approval of the version to be published; AND (4) Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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