

Clinical Science

Alcohol withdrawal syndrome in admitted trauma patients



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Abstract

BACKGROUND: As alcohol use is highly prevalent in trauma patients, we hypothesized that a significant proportion of hospitalized trauma patients would demonstrate alcohol withdrawal (AW).

METHODS: The trauma registries at a joint trauma center system from 1999 to 2008 were evaluated for patients aged at least 16 years.

RESULTS: Of 19,369 trauma admissions, 159 patients had AW. Blood alcohol concentration (BAC) testing was performed in 31.5% of the patients. BAC was significantly higher in AW patients versus other traumas (205.7 ± 130.1 vs 102.9 ± 121.7 mg/dL). BAC was 0 in 14.4% of AW patients. As compared with other trauma patients, patients with AW had a significantly greater age (50.2 vs 42.1 years), hospital length of stay (10 vs 3 days), intensive care unit length of stay (2 vs 0 days), need for mechanical ventilation (34% vs 12.7%), and pneumonia (12% vs 2.3%). AW patients were less frequently discharged to home (59.8% vs 69.9%). Mortality was not different.

CONCLUSIONS: AW was diagnosed in few patients. Of note, it occurred in patients with an initial BAC of 0. AW is associated with adverse outcomes.

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Alcohol use and abuse is highly prevalent in trauma patients. Alcohol has been reported to be involved in 31% of traffic-related fatalities and nearly 40% of violent crime.¹⁻³ Data on nonfatal crashes is less clear, and vary by reporting

method used. An estimate from the US highway, National Highway Traffic Safety Administration in 1999 indicated that alcohol was involved in about 9% of nonfatal motor vehicle crashes.⁴

In turn, approximately 50% of US trauma center patients report an alcohol use problem.⁵ At one US urban trauma center, 47% of admitted trauma patients had a positive blood alcohol concentration (BAC) and 35.8% were intoxicated.⁶ Another urban trauma center found evidence of acute and/or chronic alcohol abuse in 48.2% of admitted trauma patients.⁷ At a South African trauma center, 60% of patients had a

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positive alcohol screen on breath analysis and 25% would be categorized as chronic alcoholics based on responses to a questionnaire.⁸

The prevalence of alcohol withdrawal syndrome (AWS) in hospitalized trauma patients however remains unclear. Prevalence appears to vary in part by definition and also by recognition, or lack thereof, of milder alcohol withdrawal (AW) symptomatology. AWS symptomatology generally falls into several clusters. The symptoms develop because alcohol is a central nervous system (CNS) depressant. Specifically, alcohol alters CNS sensitivity to gamma-aminobutyric acid and glutamate (via the *N*-methyl-D-aspartate receptor).^{9,10} Cessation of alcohol results in CNS excitation. Minor symptoms (eg, headache, anxiety, diaphoresis, tremulousness) may present within 3 to 6 hours of cessation of alcohol intake, even though BAC is not zero.¹¹ Approximately 15% of patients experience withdrawal seizures.¹⁰ They generally occur within 12 to 48 hours following the last intake of alcohol, but they may occur as early as 2 hours following the last alcohol intake.⁹ Alcoholic hallucinosis (ie, visual, auditory, or tactile hallucination) occurs within 12 to 24 hours of the last alcohol intake and terminates within 1 to 2 days.⁹ Finally, DT begins within 2 to 4 days of last alcohol intake, generally lasts for 2 to 5 days (but much longer durations have also been noted), and is characterized by fever, hypertension, tachycardia, agitation, diaphoresis, and hallucinations.¹¹

As alcohol use is prevalent in trauma patients, we hypothesized that a significant portion of hospitalized trauma patients with initially detectable levels of alcohol will demonstrate withdrawal from alcohol and withdrawal would be associated with adverse outcomes. To this end, we evaluated data from our urban joint trauma center system, whereby 2 independent medical centers function together. Given the uniqueness of this urban joint trauma system, we further chose to evaluate each hospital independently to see if there were differences in the recognition of AWS.

Methods

A retrospective review was performed of the trauma registry of the 2 hospitals in our urban joint trauma center system from 1999 to 2008. All admitted trauma patients aged 16 years or older were included. This cutoff was used as it was the age of the youngest patient with AW. This study was exempt by the institutional review boards of each medical center. The 2 otherwise competing medical centers have functioned as a single state-designated level I (comprehensive) trauma center system since 1994. Each center is staffed by its own medical providers. The 2 trauma centers alternate the same days of trauma call coverage (4 at Hospital A and 3 at Hospital B) for patients arriving via emergency medical services and for most transfers from other medical facilities. Each hospital is responsible for its own "walk-in" trauma patients.

With regards to AW data, we evaluated complication code 7001 in the NTRACS database version 4.2 (Digital

Innovation, Forest Hill, MD). The diagnosis of AW was based on physician documentation. We did not have advanced practice clinicians during this time period. Blood alcohol levels were also tabulated, where available. In patients with readmission for the same principal diagnosis, only the index hospitalization was counted, as we were only assessing AW in the acutely injured.

In statistical calculations, the percentage of patients with a given characteristic was determined from the total number of patients for whom that data point was available. Statistical analyses were performed using SAS version 9.3 (SAS, Inc, Carey, NC). Categorical data were evaluated using the Wilcoxon rank-sum test or chi-square test (mortality rate, sex, disposition). Univariate and multivariate analyses were performed and a *P* value of less than or equal to .05 was considered statistically significant.

Specifically, for multivariate logistic regression analyses to evaluate age or BAC level and risk for AW, included variables were age category (16 to 29, 30 to 64, 65+ years), BAC (0, 10 to 80, 81 to 200, 201 to 300, 301+ mg/dL), sex (male/female), blunt versus penetrating mechanism, and injury severity score (ISS). Recognizing that AW rarely occurs in patients under age 30, age categories were chosen to separate young patients from elderly patients and to generate sufficient patients in each category.¹¹ BAC cutoff levels were chosen to separate patients with no alcohol to common limits of intoxication (80 mg/dL) in the United States and higher levels. Subsequently, a stepwise selection procedure was used, with variable entry and stay in the model set at *P* value less than or equal to .05. The variables in the final model were age category and alcohol category. None of the other variables were statistically significant.

Results

AW was diagnosed in .82% (159) of the 19,369 admitted trauma patients, who were at least 16 years old, during the 10-year study time period (1999 to 2008); 86 at Hospital A and 73 at Hospital B (Table 1). The median age of admitted patients with AW was significantly higher at 50.2 years versus 42.1 year in all other traumas. The youngest patient with AW was 16 years old and the oldest patient was 92 years old. The median ISS was 9 in both groups, but it was statistically significantly higher because of the differing interquartile ranges in AW patients and all other traumas. Of note, the median initial Glasgow Coma Score (GCS) was similar between the 2 groups at 15. As compared with other trauma patients, AW patients had a longer median hospital length (10 vs 3 days, *P* < .05) and median intensive care unit (ICU) length of stay (LOS) (2 vs 0 days, *P* < .05). As compared with other trauma patients, more AW patients required mechanical ventilation (34.0% vs 12.7%, *P* < .05), and for a longer time period (2.0 vs .7 days, *P* < .05). AW patients also had higher rate of pneumonia development at 12.0% vs 2.3% (*P* < .05). In terms of discharge disposition, fewer AW patients were discharged home at 59.8% vs 69.9% (*P* < .05)

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