

Suicidal ideation and sobriety: Should acute alcohol intoxication be taken into account for psychiatric evaluation?

Daniel Keyes^{1,2,3,4} | Philip Talarico⁵ | Blake Hardin^{2,4} | Alexander Molter² |
Honesty Lee² | Hisham Valiuddin⁶ | Brandon Moore³

¹College of Osteopathic Medicine, Michigan State University, Lansing, Michigan, USA

²GME Research Department, Trinity Health Livonia Hospital, Livonia, Michigan, USA

³Departments of Emergency Medicine and Psychiatry, Trinity Health Livonia Hospital, Livonia, Michigan, USA

⁴Natural Sciences, College of Arts Sciences and Letters, University of Michigan-Dearborn, Dearborn, Michigan, USA

⁵Meadville Medical Center, Mind Body Wellness Center, Meadville, Pennsylvania, USA

⁶Emergency Medicine, Perelman School of Medicine, University of Pennsylvania, Philadelphia, Pennsylvania, USA

Correspondence

Daniel Keyes, Department of Emergency Medicine, Trinity Health Livonia Hospital 36475 Five Mile, Livonia, MI 48154, USA. Emails: bihardin@umich.edu; daniel@wiseworker.com

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Abstract

Background: When evaluating an emergency department (ED) patient who presents with suicidal ideation, it is a common practice to wait until the patient's ethanol level is known or calculated to be less than 80mg/dl to evaluate patient safety. We know of no study that establishes an association between the degree of alcohol intoxication based on a blood alcohol level (BAL) and reported suicidal ideation (SI) upon recovery.

Methods: We conducted a retrospective review of patients evaluated in a Midwestern ED for the calendar year 2017. Cases were selected if they had a psychiatric social work consult and a blood alcohol level drawn while in the ED. Patients were selected on the same 2 days each week throughout the year to meet the sample size requirements of the study, resulting in 1084 cases for review. Chi-square analysis was used to evaluate the relationship between suicidal ideation and alcohol intoxication as defined by a BAL ≥ 80 mg/dl.

Results: Among patients presenting with suicidal ideation and a concurrent BAL ≥ 80 mg/dl, 69% no longer reported suicidal ideation when their BAL was < 80 mg/dl, compared to 38% for patients without a positive BAL on presentation (chi-square, $p = 0.000012$).

Conclusion: Our data show that patients presenting to the ED with complaints related to suicidal behavior who have a BAL ≥ 80 mg/dl are more likely to no longer endorse having suicidal ideation once their BAL is < 80 mg/dl than patients with similar presenting complaints and no alcohol intoxication. This finding supports the common ED practice of re-assessing suicidal ideation among individuals who are initially intoxicated once their BAL has decreased below 80 mg/dl.

KEYWORDS

acute alcohol intoxication, alcohol-related disorders, emergency services, suicidal ideation, suicide assessment

INTRODUCTION

Suicide is an important societal problem, and suicidal patients frequently present to the nation's emergency departments (EDs). Data from the National Hospital Ambulatory Medical Care Survey

revealed that there are more than 400,000 ED visits annually for attempted suicide (Canner et al., 2018; Doshi et al., 2005). Of these, approximately one-third of individuals are admitted to the hospital. Suicide is the 10th most common cause of death in the United States and the second most common cause in the 15 to 34 years age group.

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According to the Centers for Disease Control and Prevention (CDC), in the United States, there were over 47,000 deaths due to suicide in 2017 and 383,000 emergency department visits for “self-inflicted injury,” which includes self-harm with or without suicidal ideation (U.S. Department of Health and Human Services, 2017).

Acute alcohol ingestion often accompanies suicidal ideation (Cherpitel et al., 2004). According to data from the National Violent Death Reporting System, alcohol was detected in nearly 36% of males and 28% of female suicide decedents (Kaplan et al., 2012). Acute alcohol use is a potent risk factor for suicidal ideation and suicide attempt (Conner et al., 2014). There is an extensive body of literature on alcohol intoxication which uses the terms “inebriation” and “intoxication,” defined as BAL <80mg/dl, interchangeably, and the authors will follow this practice in the ensuing discussion. The terms “sober” and “sobriety” are also widely used and for the purposes of this investigation will be defined as having a BAL > 80mg/dl.

It is commonly assumed that patients cannot be definitively diagnosed as suicidal until they are clinically sober. The current norm in the emergency setting is to wait until intoxicated suicidal individuals “sober up” and then reassess them for safety (Betz & Boudreaux, 2016; Conner et al., 2014; Simpson, 2019). In 2015, the Suicide Prevention Resource Center (SPRC) published “Caring for Adult Patients with Suicide Risk, A consensus guide for emergency departments.” It recommends that the person evaluating the patient with suicide risk should “wait until the patient is sober to perform assessments” (Allen et al., 2015). A nationwide survey of emergency psychiatrists and behavioral health specialists found that most use “clinical sobriety” when assessing an inebriated patient, while a large subset used a patient's repeat blood alcohol level (BAL) as compared to a prespecified number (Simpson, 2019). A specific alcohol level of 0.08g/dl (80mg/dl) was adopted nationally in 1998 as an enforceable marker of intoxication for motor vehicle enforcement (U.S. Department of Transportation, 2001), and this number is also used by many practitioners as a numerical estimate of sobriety and decisional capacity. However, we are not aware of any study that evaluates whether a temporal association exists between the degree of alcohol intoxication and the intensity of reported suicidality. Specifically, it is important to determine if patients intoxicated with alcohol, who are identified to be at risk for suicide by the emergency practitioner and/or behavioral specialists, ultimately will be more or less likely to be suicidal upon sobriety (BAL <80mg/dl) as compared to non-intoxicated patients.

In many institutions, psychiatric consultation may be used to determine the appropriate disposition of the patient. In others, the emergency practitioner determines this independently. This is particularly true in the case of suicidal ideation. Only larger tertiary care institutions typically have specialized psychiatric emergency departments, numbering approximately 100 across the United States, making real-time ED evaluations by a psychiatrist more rare (California Healthline, 2019).

The importance of identifying suicidal ideation in patients before leaving the hospital cannot be overstated. If a patient presenting

with suicidal ideation is sent home prematurely, they are at risk of injuring themselves or others. This could also result in legal and financial ramifications for the practitioner and the hospital or healthcare system that releases them.

During the COVID-19 pandemic, increases in depression and suicide have been reported, especially in the adolescent age range, less so among adults (COVID-19 Mental Disorders Collaborators, 2021; Yard et al., 2021). In addition, presentations for alcohol intoxication increased substantially during the pandemic (Keyes et al., 2021). For this reason, it may be important to examine the impact of sobriety on the diagnosis of suicidality prior to the pandemic when it can be evaluated in its more natural context.

Goals of this investigation

Our hypothesis is that patients presenting with blood alcohol levels (BAL) \geq 80mg/dl and suicidal ideation are more likely to have a resolution of their SI than suicidal patients presenting to the ED with BAL <80mg/dl.

MATERIALS AND METHODS

Study design and setting

This was a retrospective study of pre-COVID medical records for patients who were evaluated for suicidal ideation in the emergency department from January to December 2017 when a policy of repeat EtOH level determination was in place at the study site. This research was approved by the St. Joseph Health System Institutional Review Board (IRB).

Selection of participants

This study was performed at a medium-sized community hospital and trauma center, with an approximate annual emergency department volume of 50,000 visits. Adults (\geq 18 years) were included if they stated suicidal intent and had an alcohol level drawn and received a social work/behavioral health specialist evaluation in the ED on the same 2 days per week in 2017. Blood alcohol level (BAL) was routinely drawn on all psychiatric adult patients at this institution on arrival. An EtOH level \geq 80mg/dl was defined as alcohol intoxication for the purposes of this study. A repeat EtOH BAL <80mg/dl was required prior to social work evaluation. Basic demographics as well as the presence of co-ingestants at the time of evaluation were collected.

Outcome measures

Our primary outcome was the resolution of suicidality upon BAL <80mg/dl as determined by a social worker or psychiatrist through

a direct interview and evaluation of the patient after BAL <80mg/dl was achieved.

Data collection, processing, and analysis

Encounters were obtained by identifying all medical records of patients who received a social work/behavioral health evaluation. An abstraction tool and data dictionary were developed. Abstractors were trained using these tools. After testing these tools on a subset of records by all of the abstractors, the tools were modified and implemented for the remaining data collection. A 1-week convenience sample was used to determine the sample size, including 118 social work consults, and these were filtered for any patients who were evaluated for suicidal ideation with or without alcohol intoxication. This subset of patients was used for the calculation of a sample size requirement of approximately 1050 encounters. This was achieved by taking the study sample from the same 2 days per week throughout one calendar year. The use of a complete year was done to remove the influence of seasonality on the sample. Chi-square analysis was used to evaluate the relationship between suicidal ideation and alcohol intoxication, and descriptive statistics were used for age, gender, and initial EtOH level. Statistical analysis was performed using SAS statistical software (SAS, version 9.4, SAS Institute Inc., 2013).

RESULTS

There were a total of 1084 encounters reviewed for the study (Figure 1). Participants had a mean age of 39.5 years, and females constituted 48% of the participants. Of the 740 excluded, 451 did

not express SI, 102 were under 18, 148 were not evaluated by ED SW (132 no ED SW due to no SW present, on-duty at the time of evaluation, 14 community outpatient for psychiatric emergencies [COPE] patients, two left against medical advice), and 39 were duplicate generated consults on the same visit with the same financial identification number (FIN).

There were 344 total encounters identified with positive suicidal ideation at the initial emergency practitioner (EP) evaluation. Of these, 61 were found to have a BAL \geq 80mg/dl, and 19/61 (31%) continued to have suicidal ideation at BAL <80mg/dl, whereas 42/61 (69%) no longer expressed suicidal thoughts. In contrast, of the 283 cases with an initial BAL <80mg/dl, 175/283 (62%) remained with suicidal ideation at reassessment and 108/283 (38%) no longer expressed suicidal thoughts (chi-square $p < 0.0001$) (Table 1).

This difference persisted when analyzing for individual sex, both for males ($p = 0.003$) and females ($p = 0.0005$) (Table 2). Having a BAL \geq 80mg/dl upon presentation to the ED was more common in males (44/180, 24%) than in females (17/164, 10%). Stratification by race was examined, but no significant results were obtained due to a low number of minority patient encounters. Of the 344 cases evaluated for SI, 15 cases did not have race reported. Depression was the most common psychiatric diagnosis, 230/344 (67%, Table 3). Tetrahydrocannabinol (THC) was the most common agent found in urine drug screens, found in 115/197 (58%) positive drug screens (Table 4).

DISCUSSION

In this retrospective study, a cohort of patients who presented to the ED with suicidal ideation were evaluated for alcohol exposure. Patients who had evidence of alcohol intoxication on presentation,

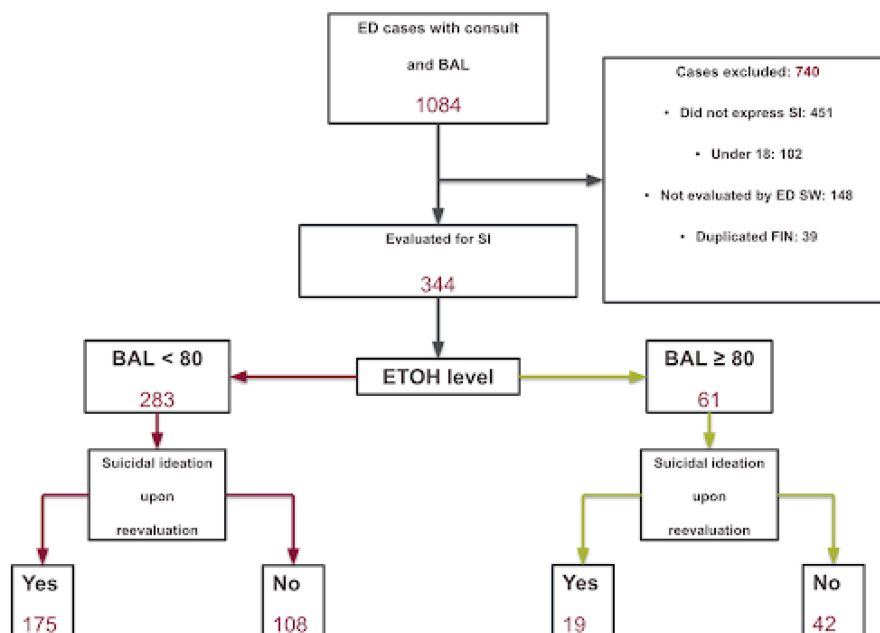


FIGURE 1 Study flowchart. BAL, blood alcohol level; ED, emergency department; EtOH, ethanol intoxication; FIN, financial identification number (specific to that visit); SI, suicidal ideation; SW, social worker/behavioral health specialist

as defined by BAL ≥ 80 mg/dl, were compared to those who were not intoxicated with alcohol at presentation. We found that there was a much lower likelihood of persistent suicidal ideation upon evaluation by a behavioral specialist among those who initially presented with alcohol intoxication. This finding would seem to support the current practice of waiting until the BAL was < 80 mg/dl for definitive evaluation of suicidality, at the index health center and many other institutions.

There is an inherent risk of death for patients who are discharged with suicidality. In addition, mental health inpatient resources are increasingly scarce, and it is critical that an efficient and accurate allocation of resources exists in this realm (Wood et al., 2018). The risk tolerance of individual emergency practitioners may also be influenced by medicolegal concerns when discharging a suicidal individual. These important factors result in heightened concern about accurately triaging selected patients to inpatient services.

Intoxication is inherently associated with high-risk behaviors, and this includes suicidal ideation and attempted suicide (Darvishi et al., 2015). The current study looks at the relationship between alcohol inebriation and suicidal ideation upon sobriety. It is possible that patients may be at increased risk for suicidal ideation *while they are intoxicated*. The current study did not address the ability to predict the potential for suicide upon future re-inebriation. However, the proximate concern of the emergency provider and behavioral health specialists is to establish safety upon discharge.

TABLE 1 Emergency department cases in which suicidal ideation is being evaluated compared against alcohol intoxication

BAL ≥ 80 mg/dl	Suicidal ideation at sobriety/ reassessment		Total
	SI present (%)	No SI present (%)	
Positive	19 (31.1%)	42 (68.9%)	61
Negative	175 (61.8%)	108 (38.2%)	283
Total	194	150	344

Note: Percentages are calculated using BAL ≥ 80 mg/dl positive/negative as the denominator and SI present/not present as the numerator.

Abbreviations: BAL, blood alcohol level; SI, suicidal ideation.

TABLE 2 Emergency department cases in which suicidal ideation is being evaluated compared against alcohol intoxication. Gender subanalysis

	Male <i>n</i> = 180		Female <i>n</i> = 164		Total
	SI present (%) [X2]	No SI present (%) [X2]	SI present (%) [X2]	No SI present (%) [X2]	
BAL < 80 mg/dl	84 (46.7%) [0.94]	52 (28.9%) [1.18]	91 (55.5%) [0.54]	56 (34.1%) [0.72]	283
BAL ≥ 80 mg/dl	16 (8.9%) [2.92]	28 (15.6%) [3.65]	3 (1.8%) [4.67]	14 (8.5%) [6.27]	61
Total	100	80	94	70	344

Note: For males, $X^2(1, N = 180) = 8.6872, p = 0.003205$. For females, $X^2(1, N = 164) = 12.2001, p = 0.000478$. Percentages were calculated using the total number of males and females separately. Chi-square values were evaluated for significance using $p < 0.05$.

Abbreviations: BAL, blood alcohol level; SI, suicidal ideation.

Suicidal ideation and risk assessment

The clinician faces an important decision with respect to providing optimal psychiatric care and, in some cases, even holding a patient against their will for their own protection. It is important to recognize that the question addressed in this study is not whether the evaluation of suicidality when the patient is intoxicated is invalid. In actuality, expression of suicidal ideation and actual risk assessment are related but not identical. Suicidal ideation (SI) is the expression of intent for self-harm. Suicide risk assessment takes into account SI, along with any other aggravating or attenuating characteristics to determine the objective likelihood of self-harm. Current practice in the evaluation of these patients begins with the patient's expression of suicidal ideation. The fact that expert consensus recommends awaiting sobriety implies that the risk of suicide is better evaluated once the patient is sober. Waiting until the patient is sober may be an effective way to mitigate the risk of clinician mismanagement of the psychiatric patient. The major finding in this study that many patients who express suicidality when intoxicated no longer do so upon sobriety seems to support this common practice.

It is noteworthy that the currently used Diagnostic and Statistical Manual of Mental Disorders (DSM) 5th Edition includes suicide as one potential symptom in the diagnosis of major depressive disorder (MDD) (American Psychiatric Association, 2013). In light of the worldwide increase in the suicide rate, it has recently been proposed that a new diagnosis of suicide behavior disorder be added to future versions of the DSM (Fehling & Selby, 2021).

Limitations

The finding that patients presenting with alcohol intoxication may have a greater intensity of reported suicidal ideation does not mean that their thoughts of self-harm should be ignored, or that there is no risk of completed suicide. All patients who present with suicidal ideation require careful evaluation and management.

This was a retrospective study, necessitated by the fact that ethical consent is very challenging for patients who are intoxicated and/or have a potentially serious psychiatric condition, both of which constitute important vulnerable populations. The study avoided

TABLE 3 Top 12 most common diagnoses among patients presenting with suicidal ideation

Diagnoses
Depression 230
Bipolar disorder 61
Alcohol use disorder 50
Anxiety 40
THC use disorder 25
Psychosis 23
Opiate use disorder 23
Other 16
Cocaine use disorder 15
Benzodiazepine use disorder 9
ADHD 5
Adjustment disorder 2

Note: The total number of patients being evaluated in the emergency department for suicidal ideation is 344.

Abbreviations: ADHD, attention-deficit/hyperactivity disorder; BAL, blood alcohol level; SI, suicidal ideation; THC, tetrahydrocannabinol.

confounding by the COVID-19 pandemic by using data prior to its onset.

Our institutional review board requested that we use de-identified data in order to comply with state laws for substance use disorders. We chose to perform the analysis using this format, which precluded the possibility to evaluate for return visits.

In the current study, no specific scale or instrument was used to determine a final diagnosis of suicidality. Various instruments have been designed to evaluate the risk of suicide and safe disposition, and the American College of Emergency Physicians (ACEP) clinical policy criticizes these scales as being ineffective at predicting the risk of self-harm or death (Mullinax et al., 2018). Additionally, this study may lack external validity due to being a single-institution sample and generally lacking minority representation.

Dual diagnosis is a term used to describe those who have both a mental health diagnosis and a co-occurring substance use disorder. This is a frequently seen subset of patients in emergency health settings. Thorough assessments and treatment of each diagnosis are accepted best practices for these patients (Rodríguez-Cintas et al., 2018; Szman et al., 2012). Most, if not all of these patients may be considered to have a co-occurring mental health diagnosis

TABLE 4 Most common co-intoxicants done in a standard urine drug screen done in the emergency department

Co-intoxicant/diagnoses	Number of cases	Percent of study cases
THC	115	33.4%
Benzodiazepines	92	26.7%
Cocaine	52	15.1%
Opiates	38	11.0%
Amphetamines	15	4.4%
Barbiturates	9	2.6%
No co-intoxicant	147	42.7%

Abbreviation: THC, tetrahydrocannabinol.

and substance use disorder. In the current study, we have chosen to focus solely on examining any relationship between intoxication and suicidality irrespective of “dual diagnosis.” It has also been suggested that the tendency to use alcohol as a coping strategy may be a marker of the risk of increased alcohol use prior to a suicide attempt (Gauthier et al., 2019).

The authors acknowledge that there may be some variability between the diagnosticians who determined the final diagnosis of SI. No attempt was made to evaluate the data using a block analysis based on individual practitioners.

The Department of Transportation's Appropriations Act for FY2001 made federal highway construction funds dependent on states enacting laws prohibiting driving with 0.08 g/dl (80 mg/dl) or greater blood alcohol concentration (BAC) (US Department of Transportation, 2001). Although sobriety has been legally defined in terms of these specific blood levels, they may not correlate with clinical sobriety in all individuals. It is known that alcohol tolerance can impact cognitive ability and mechanical performance (National Institute on Alcohol Abuse and Alcoholism 1995) (Tabakoff et al., 1986). For example, chronic alcohol use is known to result in increased tolerance in some individuals, and these individuals may be clinically sober at higher levels of serum alcohol (Roberts & Dollard, 2010). It has been observed that the effects on cognition are greater when serum levels are increasing than when they are decreasing (Mellanby effect), which suggests an opportunity for future research on the timing of alcohol measurement in these patients (Holland & Ferner, 2017). Additionally, a clinical evaluation of intoxication can be affected by the presence of certain drugs and individual variations in body metabolism, including pharmacokinetics and pharmacodynamics.

The presence of co-ingestants was documented as part of the data abstraction process. However, no analysis of the association between toxicology screening results and the major outcome measure was performed because the limited sample size would result in low reliability. Also, it is impossible to determine if patients with positive urine drug screens are under the influence of that particular agent at the time of the test. Many agents are known to be detectable by qualitative methods long after their

effects are clinically manifested. Future research should evaluate the impact of various individual agents on SI, perhaps using a similar methodology as the current study. This may require the use of quantitative methods to correlate more closely with intoxication. Also, future investigations are needed to directly assess the likelihood of actual completed suicide among patients who express suicidal ideation only while intoxicated. In other words, it is possible that patients who only express SI while intoxicated are at some increased risk of future self-harm. In addition, it would be helpful to evaluate the contribution of other intoxicating agents to the dynamics of suicidal ideation.

CONCLUSION

In this study of pre-COVID-19 patients presenting to an emergency department with suicidal ideation, alcohol intoxication was clearly associated with a greater intensity of reported suicidality as measured by behavioral professional specialist evaluation upon blood alcohol level decreasing to less than 80 mg/dl. Prior to sobriety from alcohol, a definitive risk assessment in an intoxicated patient may be premature. This suggests that it is prudent to await sobriety prior to the definitive assessment of patients with a risk of self-harm.

CONFLICT OF INTEREST

The authors have no conflict of interest to report.

ORCID

Daniel Keyes  <https://orcid.org/0000-0002-8625-5703>

Blake Hardin  <https://orcid.org/0000-0002-8608-9522>

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