

THE DEVELOPMENT OF A BEHAVIORALLY-BASED ALCOHOL INTOXICATION SCALE

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Introduction: The ED and Behavioral Health (BH) department developed a behaviorally-based alcohol intoxication scale (AIS) to assess when patients can be transferred to the BH unit from the ED rather than using blood alcohol levels. The purpose of this study was to determine the reliability and validity of the scale. A secondary purpose was to determine whether there was any correlation between blood alcohol level and the alcohol intoxication scale.

Methods: Inter-rater reliability was calculated by assessing the same patient at the same time by 2 people. To assess for criterion-related validity of the scale, the medical records of the subjects were reviewed in behavioral health to determine whether the patients being transferred to BH were medically stable.

Results: Using Krippendorff's alpha to assess inter-rater reliability, the total score on the AIS yielded an alpha of

0.9396. To assess for criterion-related validity of the scale, the charts of the subjects were reviewed; data supported that the patients were medically stable after transfer. As expected, there was no correlation between the AIS and blood alcohol level. The results of this study show initial reliability and validity for the AIS.

Discussion: This study showed preliminary support for using a behaviorally-based assessment as a basis for transferring patients to the BH unit. More studies are needed to further substantiate the reliability and validity of this measure as a tool to accurately assess stability for transfer to a BH unit.

Key words: Alcohol intoxication scale; Behavioral assessment; Emergency department

The World Health Organization (WHO) has estimated that about 2 billion people worldwide drink alcoholic beverages and 76.3 million people have diagnosable alcohol use disorders.¹ The burden associated with alcohol use is significant, both in terms of morbidity and mortality and the social costs of drinking, such as loss of employment, homelessness, risky sexual behaviors, intimate partner violence, suicide, depression, and divorce.^{2,3} Alcohol is a contributing factor in many traumatic injuries and chronic conditions. According to the 2011 WHO Global Status Report on Alcohol and Health,

“Alcohol consumption is estimated to cause from 20-50% of cirrhosis of the liver, epilepsy, poisonings, road traffic accidents, violence and several types of cancer”² (p. 20).

Annually, alcohol causes 2.5 million deaths worldwide (4% of the total number of deaths) and 4.5% (59.3 million) of the total disability-adjusted life year which is a measure of overall disease burden, expressed as the number of years lost due to ill-health, disability, or early death.² In addition, 10% to 18% of injured patients who seek care in emergency departments have alcohol-related injuries,⁴ and 21% to 34% of the 110 million annual ED visits are alcohol related.⁵ Based on these data, it appears that many emergency departments may treat large numbers of intoxicated patients who also have a history of alcohol-related problems and could possibly benefit from an admission to an inpatient behavioral health unit (BHU).

Our 2 Midwestern emergency departments were challenged by the number of behavioral health admissions who were held in the emergency department because their blood alcohol concentration (BAC) was deemed too high for transfer. Our BHU would not accept patients for admission until their BAC was less than 0.2%. In an attempt to address the crowding that occurred as a result of these behavioral health holds, our team began exploring

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options for safely expediting transfer of behavioral health admissions. The BAC of 0.2% was chosen arbitrarily by the physicians and staff of the BHU. Their goal was to avoid any negative patient outcomes due to alcohol intoxication, because their focus is on behavioral issues rather than medical problems. In addition to the arbitrary BAC criteria, waiting for patients to reach this level also required multiple blood draws, which was uncomfortable for the patients and used additional staff resources. More importantly, many of the patients “waiting on arbitrary sobriety” were stable, even though their BAC levels were higher than the stated criteria.

Our review of the literature revealed that weak to moderate associations exist between the BAC and the symptoms associated with acute alcohol intoxication.⁶⁻⁸ Research also identified the impact of age, race, gender, and, in particular, prior history of heavy alcohol use on the rate of alcohol metabolism and the display of symptoms.⁹⁻¹¹ According to the 2004 WHO Global Status Report on Alcohol, a person is believed to be under the influence of alcohol “when the quantity of alcohol consumed exceeds the tolerance (metabolism or elimination) for alcohol and produces impairment in the person’s mental and physical ability”¹ (p. 11).

Version 10 of the International Classification of Disease Clinical Modification classified alcohol use and included the concept of harmful use. An example of the Y91 code is as follows:

Y91.0 Mild alcohol intoxication: smell of alcohol on breath, slight behavioral disturbance in functions and responses, or slight difficulty in coordination
Breath Alcohol Concentration: 0.060-0.099 (Y90)⁶ (p. 3)

Benegal et al⁶ assessed the validity of the Y91 codes by comparing the codes to the breath alcohol concentration (BrAC). These investigators found that when all of the BrACs were included, the overall weighted Kappa was 0.54 (the weighted Kappa includes some weight to near misses). However, when all of the BrACs that were 0 were removed from the analysis, the weighted Kappa decreased to 0.25. These investigators concluded that ED physicians could accurately distinguish between nonintoxicated patients (BrAC <0.059) and severely intoxicated patients (BrAC >0.299). However, assessment of patients’ level of intoxication in the middle ranges of the BrAC was weak. Higher agreement between the physician’s and the patient’s subjective assessments of intoxication levels was found. Cherpitel et al⁸ discovered similar findings when comparing the Y90 and Y91 codes, noting that agreement between the BAC and the Y91 codes was moderate, but in persons who were actually drinking in the previous 6 hours, the concordance was much less.

Teplin and Lutz¹² examined the reliability of the Alcohol Symptom Checklist (ASC), a clinical assessment tool for symptoms of alcohol intoxication, and reported a correlation of $r = 0.77$ ($P < .001$) between the ASC and the BrAC in ED patients with a BrAC greater than zero. However, Sullivan et al⁷ used the same ASC and found that correlations were 0.235 between the ASC and the BrAC. The researchers attributed the low correlations to a high rate of chronic alcoholism among subjects in their study and the high tolerance these subjects experience, which may decrease the visible appearance of some symptoms associated with this disease process.

Based on these findings, our team of physicians, nursing leadership, and staff from the emergency department and BHU partnered to devise a strategy to more accurately assess when patients were able to safely transfer from the emergency department to the BHU. A review of the literature obtained from PubMed revealed that many of the alcohol screening assessments conducted in emergency departments are used to determine whether patients have problem-drinking habits or are dependent drinkers.¹³ Generally, alcohol-screening instruments can be categorized as self-report and structured interview assessments and clinical laboratory tests.^{14,15} The goal of these tools is to identify patients at risk for alcohol misuse and provide them with referrals to various resources aimed at addressing potential problems associated with their alcohol abuse. The group did not find any instruments that met their requirements for a behaviorally based assessment.

The purpose of this study was to evaluate the reliability and validity of the Alcohol Intoxication Scale (AIS). The secondary purpose was to assess the relationship between BACs obtained in our emergency department and the score on the AIS to determine whether our data support a weak correlation between BAC and symptoms of intoxication.

Methods

The original group that designed the AIS consisted of physicians and nursing leadership from the emergency department and the BHU. The 2 emergency departments are part of a large Midwestern medical center. These 2 emergency departments have a total of 58 ED beds and approximately 103,000 patient visits a year. The BHU has 24 adult psychiatric beds and 20 geriatric psychiatric beds. The geriatric psychiatric unit does not accept patients with a primary problem of alcohol detoxification, per a Medicare rule.

The Clinical Institute Withdrawal Assessment of Alcohol Scale (CIWA) was reviewed, but because that scale is used for withdrawal symptoms and not for alcohol intoxication symptoms, it was not appropriate for our needs. When nothing was found in the literature that met their

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