

CASE REPORT

Accident, decreased consciousness, and Alcohol use, which is the cause and which is the effect

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Abstract

Introduction: Altered levels of consciousness in emergency settings, particularly in the presence of a reported history of alcohol consumption, may lead to misdiagnosis and delayed detection of life-threatening intracranial conditions such as cerebral hemorrhage. This case report aims to highlight the diagnostic challenge of intracerebral hemorrhage presenting with features suggestive of alcohol intoxication and to emphasize the importance of avoiding diagnostic anchoring based on companion reported history.

Case Report: This case report describes a 38-year-old male who was admitted to the poisoning department of Imam Reza Hospital, in 2025 with a decreased level of consciousness and suspected alcohol intoxication. Initial clinical assessments and laboratory investigations were performed. Owing to persistent neurological impairment, brain computed tomography was subsequently obtained.

Discussion: Clinical assessment was initially confounded by reported alcohol use; however, neuroimaging confirmed a significant intracerebral hemorrhage. Retrospective evaluation revealed a neglected history of minor trauma, illustrating the critical importance of excluding structural brain injuries in patients with altered consciousness, regardless of reported intoxication.

Conclusion: This case underscores the necessity of prioritizing objective clinical assessment and comprehensive neurological examination over third-party history in patients with altered mental status. Early consideration of structural brain injury and timely neuroimaging are crucial to preventing diagnostic delay and reducing adverse clinical and medicolegal outcomes.

Keywords: Intracerebral hemorrhage, Methanol, Decreased consciousness, Diagnostic, Effect

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INTRODUCTION

Alcohol use disorder (AUD) is a chronic and recurrent condition marked by diminished control over alcohol intake, resulting in substantial harm to both individuals and society, and constitutes a significant global public health concern [1]. Alcohol consumption accounts for an estimated three million deaths globally each year and represents a significant contributor to the global burden of disease as measured by disability adjusted life years [2]. Chronic and excessive alcohol consumption has been consistently linked to a wide range of detrimental physical and mental health outcomes, including cardiovascular disease, multiple forms of cancer, mood and anxiety disorders, and progressive neurocognitive impairment such as dementia [3]. Moreover,

alcohol-related liver disease remains one of the leading indications for liver transplantation globally [4].

Accurate identification of alcohol use patterns and abstinence is of critical importance in clinical practice to guide management strategies and improve treatment outcomes. Currently, self-reported measures remain the most commonly employed tools for assessing alcohol consumption. These include standardized instruments such as the Alcohol Use Disorder Identification Test (AUDIT) [5] and the Timeline Follow-Back (TLFB) method [6]. Despite their practicality, low cost, and ease of administration, self-report approaches are inherently limited by potential recall bias and deliberate underreporting, particularly in contexts where disclosure may be associated with stigma, legal implications, or other negative consequences [7]. Diagnostic anchoring bias represents a

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well-recognized cognitive error in clinical decision making, whereby excessive reliance on initial or externally provided information, such as a history obtained from relatives or bystanders, leads clinicians to prematurely narrow the differential diagnosis and overlook alternative, potentially life threatening conditions [8].

From a forensic medicine perspective, such delays in recognition, incomplete neurological examination, and overdependence on third-party information may have serious medicolegal implications, particularly in cases of subsequent deterioration or death. This case underscores the essential role of independent clinical judgment, meticulous neurological assessment, and timely objective investigations in mitigating cognitive bias and ensuring both appropriate patient care and forensic defensibility [9].

This case report aims to highlight the diagnostic challenge posed by intracerebral hemorrhage presenting with clinical features that may mimic acute alcohol intoxication, and to underscore the importance of maintaining a broad differential diagnosis despite a history suggestive of alcohol use provided by companions.

CASE PRESENTATION

In 2025, a 38 year old male patient was presented to the emergency department of Imam Reza Hospital and was subsequently admitted to the poisoning unit due to decreased consciousness. Initial neurological assessment revealed no response to verbal stimuli and bilateral mydriasis. The patient's vital signs were relatively stable, with an arterial oxygen saturation of 95%. According to the accompanying friend, he had ingested industrial alcohol over the previous two days. In light of the reported history and clinical findings, a preliminary diagnosis of methanol poisoning was considered. Initial laboratory investigations, including serum alcohol level, serum methanol level, and venous blood gas analysis, were performed. The results of the tests showed that the patient's blood alcohol level was 70 mg/dL on admission, indicating the presence of alcohol in the early stages of clinical assessment. Venous blood gas analysis also showed a pH of 7.36, HCO₃ level of 19 mEq/L, and PCO₂ of 34 mmHg. Overall, these findings did not provide evidence for severe metabolic acidosis. However, the patient's neurological status was alarming; his level of consciousness was recorded as 15/8 on the Glasgow Coma Scale at the initial assessment. During several hours of observation in the emergency department, the patient's level of consciousness did not improve and bilateral mydriasis persisted. Despite the relative preservation of oxygen saturation and the absence of severe metabolic derangement, the diagnostic focus remained mainly on toxicological causes, especially toxic alcohol intoxication, and brain imaging was not performed immediately. Ultimately, after a brain CT scan, intracerebral hemorrhage was identified as the main cause of the patient's clinical presentation. It should be noted that the patient had suffered trauma before presenting to the hospital. This case highlights the

considerable diagnostic difficulty of intracerebral hemorrhage when it presents with clinical features similar to acute alcohol intoxication. Overreliance on the alcohol history provided by companions led to diagnostic fixation and delayed recognition of a life-threatening neurological condition. Failure to perform timely neuroimaging, despite variable consciousness and abnormal pupil findings, further contributed to the delay in definitive diagnosis.

DISCUSSION

A common but difficult diagnostic sign in emergency medicine is altered mental status. Individuals suspected of drinking too much alcohol may become unconscious due to intoxication alone, delaying the discovery of a major intracranial disease [10]. This case illustrates how a reliable but incomplete history of comorbidities can help clinicians begin the diagnostic process and prevent them from considering potentially fatal options such as intracerebral hemorrhage. However, as the clinical course progressed, several findings should have prompted an early revision of the initial diagnostic impression. First, a history of trauma prior to hospital admission was an important feature that broadened the differential diagnosis and should have raised suspicion of intracranial structural injury. Second, the severity of the neurological impairment was not fully explained by the laboratory findings. The patient had an initial Glasgow Coma Scale score of 8.15 and persistent bilateral mydriasis, but the reported findings on venous blood gas analysis did not support severe metabolic acidosis. Although toxic alcohol intoxication can present variably, the absence of a specific acid-base disturbance reduced the likelihood that toxic substance ingestion alone explained the patient's low level of consciousness. Third, the lack of neurological improvement during several hours of observation in the emergency department was another red flag that the initial diagnosis may be incomplete or incorrect. Diagnostic anchoring, a well-known cognitive error in emergency medicine, occurs when a physician narrows the differential diagnosis too quickly by placing too much emphasis on his or her initial impression [11, 12]. Given the patient's reported industrial alcohol consumption, methanol poisoning was the primary concern, and toxicology testing was of paramount importance. However, the patient's neurological findings were not entirely consistent with simple intoxication. Previous neuroimaging was performed because of bilateral mydriasis, persistent loss of consciousness, and failure to improve over time. From a diagnostic reasoning perspective, this case may be considered a clinical course indicative of anchoring bias. It cannot be concluded with certainty that diagnostic anchoring has occurred. In the present setting, anchoring is particularly dangerous when initial impressions are based on external data rather than direct clinical evidence.

The main finding of this study is that alcohol consumption should be considered a possible confounder, not a definitive cause of altered consciousness. Alcohol intoxication can make one confused, uncoordinated,

drowsy, and unable to react quickly, all of which may mimic a head injury. At the same time, intoxication can be associated with traumatic brain injury or intracerebral hemorrhage, thus complicating the clinical distinction. Alcohol also affects the reliability of the Glasgow Coma Scale and can make neurological assessment in individuals with brain injury challenging. Park and colleagues showed in head injury patients that alcohol intoxication affects the interpretation of the GCS, thus emphasizing that decreased consciousness after alcohol exposure should not be assumed to be purely toxicological [11]. Previous studies have also shown that alcohol intoxication may complicate the interpretation of the Glasgow Coma Scale in patients with head injury, making it unsafe to attribute decreased consciousness solely to intoxication. For this reason, the presence of alcohol exposure should not reduce clinical suspicion of structural brain damage in cases where neurological findings are severe, persistent, or disproportionate to metabolic abnormalities [11, 12]. An overlooked history of minor trauma is another important component of this condition. Even seemingly minor head trauma can lead to serious intracranial hemorrhage if the patient's history is incomplete or the symptoms are attributed to intoxication. In head trauma patients in the emergency department, the JACEP Open 2024 study also demonstrated an association between alcohol consumption and intracranial hemorrhage, emphasizing that alcohol consumption and cerebral hemorrhage are not mutually exclusive and may occur together [10]. Therefore, if neurological problems persist, the presence of alcohol consumption should reduce, not increase, the level of confidence in a purely toxicological diagnosis.

Unexplained altered mental status warrants neuroimaging. In JAMA Network Open, a systematic review and meta-analysis found that computed tomography (CT) of the head offers significant diagnostic utility in selected individuals with acute nontraumatic altered mental status, particularly when clinical features suggest structural brain disease [13]. In this case, delayed imaging increased diagnostic uncertainty. Since intracerebral hemorrhage is a time-sensitive diagnosis that requires early recognition, close monitoring, and the possibility of neurosurgical intervention, this delay is clinically significant. A brain CT scan should not be delayed solely because of suspected intoxication, especially if mental status does not improve as expected or if focal or unusual neurological signs are present.

This case illustrates several safeguards against diagnostic error that are useful from an emergency medicine perspective. First, clinicians should consider a broad differential diagnosis for patients whose level of consciousness has changed, even if they claim to have been drinking alcohol. Second, repeated neurological examinations are essential, and failure to improve over time should warrant reevaluation. Third, objective findings

should take precedence over assumptions based on the history of the patient. Recent clinical guidelines for drug poisoning emphasize careful evaluation and exclusion of other medical causes in patients presenting with altered symptoms. Furthermore, this condition has both forensic and medical significance. Diagnostic reliance on alcohol poisoning may not only delay treatment, but may also lead to a misdiagnosis of the true cause of worsening of the condition. This article rightly emphasizes that reliance on third-party history, inadequate neurological assessment, and failure to consider structural brain damage can have forensic consequences. To prevent errors and ensure patient safety, rapid diagnostic testing and accurate documentation are crucial in emergency and forensic settings.

Finally, this case demonstrates that intracerebral hemorrhage can coexist with, mimic, or be influenced by alcohol consumption. In patients with altered mental status, especially if trauma is conceivable, clinicians should not be too quick to dismiss the possibility of structural brain injury and should place structural brain injury at the top of the list of possible diagnoses. The use of early neuroimaging and objective clinical findings is essential to avoid delays in diagnosis and improve outcomes.

CONCLUSION

This situation emphasizes how a history of alcohol use, even with high toxicological levels, should not be interpreted as a definitive diagnosis of altered mental status. Rather than assuming that alcohol is the primary cause, medical professionals should consider alcohol exposure as a possible confounding factor that could obscure or prevent the development of concurrent and severe structural neuropathology. This document suggests that the clinical focus should shift rapidly from history taking to objective, ongoing bedside assessments when the patient's neurological deficits are consistent or not accompanied by metabolic and toxicological findings. Assuming alcohol use as a diagnosis may lead one to prematurely rule out other important problems, such as intracranial hemorrhage, thereby delaying their diagnosis. By considering alcohol use as a clinical element rather than a definitive cause and by emphasizing objective neuropsychological reassessment rather than relying on third-party reports, healthcare professionals can reduce cognitive biases, prevent delays in diagnosis, and ensure that treatable structural problems are not overlooked when substance use is suspected.

Declaration

ChatGPT (OpenAI, GPT 5) was used to assist with English language editing and phrasing. The authors reviewed and verified all outputs, and no AI tools were used to generate data, analysis, or interpretations.

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REFERENCES

1. Carvalho AF, Heilig M, Perez A, Probst C, Rehm J. Alcohol use disorders. *The Lancet*. 2019;394(10200):781-92.
2. Griswold MG, Fullman N, Hawley C, Arian N, Zimsen SR, Tymeson HD, et al. Alcohol use and burden for 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *The Lancet*. 2018;392(10152):1015-35.
3. Haber PS, Riordan BC, Morley KC. Treatment of alcohol problems: current status and future directions. *Medical Journal of Australia*. 2021;215(7):315-6.
4. Corrao G, Bagnardi V, Zambon A, La Vecchia C. A meta-analysis of alcohol consumption and the risk of 15 diseases. *Preventive medicine*. 2004;38(5):613-9.
5. Schaefer M, Heinz A, Backmund M. Treatment of chronic hepatitis C in patients with drug dependence: time to change the rules? *Addiction*. 2004;99(9):1167-75.
6. Sabel MS, Levine EG, Hurd T, Schwartz GN, Zielinski R, Hohn D, et al. Is MUGA scan necessary in patients with low-risk breast cancer before doxorubicin-based adjuvant therapy? *American journal of clinical oncology*. 2001;24(4):425-8.
7. Schieber K, Lindner M, Sowa J-P, Gerken G, Scherbaum N, Kahraman A, et al. Self-reports on symptoms of alcohol abuse: liver transplant patients versus rehabilitation therapy patients. *Progress in Transplantation*. 2015;25(3):203-9.
8. Croskerry P. The importance of cognitive errors in diagnosis and strategies to minimize them. *Academic medicine*. 2003;78(8):775-80.
9. Saukko P, Knight B. *Knight's forensic pathology*: CRC press; 2015.
10. Zirulnik A, Liu S, Wells M, Alter SM, Engstrom G, Solano JJ, et al. Alcohol use is associated with intracranial hemorrhage in older emergency department head trauma patients. *JACEP Open*. 2024;5(4):e13245.
11. Park J, Park T, Ko J-I, Yeo W. Alcohol intoxication and Glasgow Coma Scale scores in patients with head trauma. *Journal of Trauma and Injury*. 2020;33(4):227-35.
12. Munakomi S, Margetis K, Iverson LM. Glasgow coma scale. *StatPearls [internet]*: StatPearls Publishing; 2026.
13. Acharya R, Kafle S, Shrestha DB, Sedhai YR, Ghimire M, Khanal K, et al. Use of computed tomography of the head in patients with acute atraumatic altered mental status: a systematic review and meta-analysis. *JAMA Network Open*. 2022;5(11):e2242805.