ORIGINAL ARTICLE

Practice Patterns in the Diagnosis and Management of Alcohol Withdrawal Syndrome in Indian Intensive Care Units

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Received on: 15 June 2023; *Accepted on:* 01 October 2023; *Published on:* 30 October 2023

Abstract

Alcohol use disorders (AUDs) are prevalent in intensive care units (ICUs). Alcohol abuse and/or dependence, leading to alcohol withdrawal syndrome (AWS), is as high as 10% or more. There seem to be wide variations in management strategies used to manage these patients, prompting an evaluation of the knowledge gap as well as finding the barriers. Noting lack of such literature in the Indian setting, a survey is undertaken to evaluate practice patterns surrounding the identification and management of alcohol dependence/abuse and AWS in the Indian critical care scenario.

The main respondents of the survey are independent practitioners with anesthesia as their base specialty and overwhelmingly practice in multidisciplinary ICUs. They estimated AUD prevalence to be under 10%. The reason most expressed for lack of AUD documentation is fear of insurance rejection.

Very few used risk assessment tool in evaluation of AUDs and AWS. Awareness of ICD 10/DSM-V components of AWS diagnosis was negligible. Chlordiazepoxide and lorazepam were used either in a fixed- or symptom-based therapy. Compared to available literature, haloperidol use is excessive, while barbiturates rarely. The wide variation is seen with the dose and frequency of thiamine in AWS without neurological complications. The impact on mortality and morbidity is poorly understood.

In conclusion, the survey reported a lower prevalence compared to international literature. Insurance rejection is one of the main factors in limiting adequate history taking or documenting AUDs. Alcohol withdrawal syndrome risk assessment, monitoring, and management is variable and suboptimal. Variability in all aspects of AUDs is attributable to the knowledge gap. Further studies are needed to bridge the research gap.

Keywords: Alcohol use disorders, Alcohol withdrawal syndrome, Benzodiazepines, Delirium tremens, Pneumonia, Prediction of Alcohol Withdrawal Severity Scale, Thiamine in alcohol withdrawal syndrome, Urinary tract infection, Wernicke's encephalopathy.

Indian Journal of Critical Care Medicine (2023): 10.5005/jp-journals-10071-24572

Highlights

Alcohol use disorders and their prevalence and associated complications during hospitalization in the Indian critical care setting are lacking. Insurance denial risk is one of the important factors in poor documentation and, in turn, recognition. Management of alcohol withdrawal syndrome is highly variable and is due to both knowledge and research gap.

Introduction

Alcohol is one of the most common substances misused in India.[1] Alcohol use disorders (AUDs) encompass disorders characterized by compulsive heavy alcohol use and loss of control over alcohol intake, and they account for 4–25% of patients admitted to the hospital and intensive care unit (ICU).[2–4] There is a paucity of AUD prevalence data from Indian ICUs. People with AUDs, who may form a significant proportion of ICU patients, are at a risk of developing alcohol withdrawal syndrome (AWS). Alcohol withdrawal syndrome ranges from clinically nonsignificant withdrawal to delirium tremens (DT).[5] Non-Indian literature suggests that 18–25% of the patients with a history of alcohol intake develop AWS during hospitalization and more so in surgical patients compared with medical patients. This disparity may be due to the medical patient's clinical course being masked by the underlying illness.)[6] Among hospitalized patients, the ICU group tends to have higher alcohol-related complications and makes patients sicker.[7] In addition to the above, medical conditions make it very difficult to differentiate AWS from other causes of symptoms like sepsis, even in settings where there are processes to capture such patients. This makes for poor identification and, in turn, inadequate therapy.[8] This poses a higher effect on morbidity (ICU and hospital length of stay, longer mechanical ventilation, and financial burden) and mortality in this group of patients in settings where such identification and initiation of appropriate therapies are not ideal.

Lack of Indian literature in relation to AWS in the ICU may be due to various reasons like poor identification, awareness and varied treatment strategies may have contributed to the lack of Indian literature in relation to AWS. The current survey aims to estimate the AUD burden in an Indian ICU. Other aims of the survey are to understand the practice patterns (identification, assessment, and

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How to cite this article: Gopaldas JA, Padyana M, Rai PP. Practice Patterns in the Diagnosis and Management of Alcohol Withdrawal Syndrome in Indian Intensive Care Units. Indian J Crit Care Med 2023;27(11):816–820.

Source of support: Nil

Conflict of interest: None

Table 1: Baseline characteristics

Experience (< or >5 years)	
Clinicians in training	11%
Independent practitioners	89%
Base specialty	
Anesthesia	66.5%
Internal medicine	19.4%
Type of ICU	
Multidisciplinary ICU	90%
Speciality ICU (including surgical)	5%
Other	5%
Critical care training program	
Present	68%
Absent	32%

management) and appraise them in comparison to evidence-based therapies.

Methods

A survey questionnaire that included demographics of ICU doctors (age, gender, ICU experience, type of ICU, prevalence of the illness, and if it is a teaching unit or not), evaluation, diagnosis, and treatment options related to AWS was developed in series. A presurvey questionnaire to test the adequacy and understanding of the questionnaire quality was assessed in a small trial of 10 doctors belonging to the organization of the author. Later a questionnaire with 10 components was tested using an online platform reaching 50 members of the city chapter of critical care society. The results and opinions following this were used to make the final 15-component questionnaire. Here, addition of awareness of diagnostic criteria (ICD-10/DSM-V), more reasons for failure to gain adequate history (insurance rejection risk), and thiamine-related information was added to the final questionnaire, which is rolled out across India to target doctors who identify themselves as critical care clinicians.

Results

Responses from 211 doctors were included in the analyses out of 815 requests generated. Baseline characteristics point to a predominance of ICU specialists with anesthetic background (64.9%), and majority of the responders are independent practitioners (trainees are less than 10% of responders). The majority of the respondents are from multidisciplinary (90%) compared with specialty or surgical ICUs. Two-thirds of these ICUs support active teaching programs (DNB/ISCCM/DM programs) (Table 1).

Though the majority (62%) of the doctors felt the incidence of AUDs in the patients admitted to ICUs is under 10%, close to a third of them felt that it could be as high as 10–20%. A predominant number of physicians diagnosed less than two episodes of AWS in the previous week (53.1%), while quite a few (35%) did not encounter AWS at all (Table 2).

There seems to be a significant lack of detailed documentation of alcohol history in case notes, and the majority felt it to be in fear of rejection of insurance for the patient and/or denial of suspect AUDs by the patient or the next of kin (NOK). For the evaluation of alcohol dependence, the use of structured assessment tools is poor (<14%) (Table 2). More than half of the responders did not use any risk assessment tools during evaluation in patients who are

Table 2: AUDs prevalence and assessment

AUDs prevalence estimate (% of ICU admissions)	
0–10%	62%
11–20%	30%
>20%	8%
Means to identify AUDs	
Speciality questionnaires (CAGE/AUDIT)	13.7%
Routine history taking	83.4%
None of the above	2.8%
New AWS diagnosis during preceding week	
No cases	35%
1–2 cases	53%
>3 cases	12%
AWS assessment tool use in practice	
CAM-ICU	41%
Delirium detection score	10%
None	48%
Reasons for not documenting alcohol history at admission	
Fear of insurance rejection	62%
Next of kin (NOK) denied use	25%
Patient/NOK unable to give history	21%

deemed alcohol-dependent to monitor for AWS. No respondent characteristic is associated with reasons for failure to document and/or use of specific assessment tools. Surprisingly, not even a single responder knew all the required components to diagnose AWS (ICD-10/DSM-V criteria).

Coming to the treatment strategy, nearly half of the respondents choose chlordiazepoxide as their main agent of choice, while 40% choose lorazepam. Other choices like diazepam, barbiturates, or use of multiple agents simultaneously amounted to very few responses. A third of the clinicians preferred a fixed-dose regimen, while another third preferred symptom-triggered regimen when using benzodiazepines for AWS. In benzodiazepine-refractory AWS, our survey noted a clinician preference for haloperidol (>70%) as the predominant rescue agent. Other agents used to a lesser extent are dexmedetomidine (>40%), propofol (18%), clonidine (10%), beta-blockers (10%), and barbiturates (7%). There was no correlation between the choices of medications and respondents' experience or the background specialty. The survey noted wide variations in parenteral thiamine use in AWS without neurological complications. The dose and frequency analysis (Table 3) noted 200–300 mg of thiamine in general in divided doses by the majority of responders, with very few crossing a dose of 300-mg dose. It also noted very few using the parenteral thiamine dose in a single undivided dose. Varied dosing had no correlation with respondents' characteristics. Almost all who were involved in the survey were of the opinion that ICU length is prolonged by AWS when admitted with non-AUD diagnosis and more than half opined that ICU length is prolonged by 4–7 days (Table 4).

Discussion

Alcohol use disorders in India are a growing concern, with more than half of the drinkers showing a hazardous drinking pattern. Alcohol use and AUDs account for more than 6% of global mortality, and it is increasing.[9] Hospital and community studies have shown consistently that AUDs contribute to increased severity of illness, morbidity, and mortality. A threefold increase in mortality in

Table 3: Pharmacotherapy of AUDs

Choice of benzodiazepine for AWS	
Chlordiazepoxide	48.3%
Lorazepam	40.8%
Diazepam	4.7%
Multiple agent	6.1%
Benzodiazepine regimen of choice for AWS	
Fixed-dose regimen	33.6%
Symptom-triggered dosing	32%
Loading dose with maintenance dosing	20.8%
Nurse or doctor lead dosing	13.2%
Barbiturate use for AWS	
Yes	92%
No	8%
Choice of agents for benzodiazepine-resistant AWS (one or more)	
Haloperidol	73%
Dexmedetomidine	44%
Others (propofol/beta-blockers/clonidine)	36%
Parenteral thiamine for AUDs	
100 mg BID	35%
100 mg TID	30%
200 mg BID	21%
300 mg OD	10%
Other	4%

Table 4: Morbidity of AUDs

AWS influence on expected increased ICU LOS (days)	
1–3 days	35%
4–7 days	51.7%
>8 days	11.8%
Does not prolong stay	1.5%

postsurgical and trauma patients is noted when a patient suffers from AWS.[10] Based on the above observations, AWS in Indian ICUs is likely to be of the same prevalence compared with Western literature.

The survey's goal to understand the prevalence and identification of AUDs, which in turn might allow for the identification of those at risk for severe AWS through sequential questions was successful. It was also able to capture the variations in the treatment strategies. The survey response rate is 25.9%. This target population for the survey is the Indian Society of Critical Care Medicine (ISCCM) permanent members who are practicing intensivists ($n = 815$). The questionnaire was developed as a quantitative survey and made efforts to address accuracy, brevity, and clarity.[11] Over the years, the response rate for online surveys is consistently below 40%, though a response rate of >70% is deemed excellent. For our survey, repeated requests for completion of the survey, except offering incentives, were made to boost the response rate with no benefit. Online or paper-based survey response rate in the Indian subcontinent needs evaluation to find avenues to boost the response rate.[9]

Baseline characteristics (Table 1) show that the predominant responders are from multidisciplinary ICUs. These ICUs are also noted to be involved in active teaching for various Indian critical care courses (DNB, IFCCM, IDCCM, etc.). This polarity in response rate makes a generalization of survey results, but based on the available literature, the responses are likely to be better than nonteaching units.[12] The base specialty of the responder is overwhelmingly anesthesia, which is consistent with the Indian ICU census. Majority of the participants (~90%) are independent practitioners, and very few are advanced trainees, making the opinion of the survey more representative.

More than 60% of the respondents were of the opinion that the proportion of patients with alcohol use/dependence/abuse among ICU admissions is less than 10%. This contrasts with Western literature, where at-risk patients make up to 30% or more of the ICU population.[4,13] This may in part due to low prevalence in reality or due to lack of identification. ICU admissions that involve a patient who has a history of alcohol intake could be divided into index problems with acute toxicity with or without worsening to withdrawal compared with patients admitted with a medical or surgical illness but have risk factors to develop AWS. In ICUs, identification of AWS in the latter seems to be a real challenge.

Lack of identification of AUDs could be from poor history taking, communication, and/or documentation. Survey questions that looked into this aspect noted a significant finding. In our survey, fear of insurance rejection (62%) was the main reason for not undertaking the required documentation of alcohol intake. Another significant reason for poor documentation is the patient or next of kin (NOK) denying history of use (41%). This behavior, both by the patient/NOK and the treating physician, represents a stigma that is attached to the illness and needs delegitimizing.[14] Recognizing AWS in a mechanically ventilated patient is almost impossible when history is unavailable. This stigma and poor recognition in return can have worse outcomes in patients with ARDS. Alcohol withdrawal syndrome is also known to increase the duration of mechanical ventilation, pneumonia, urinary tract infection, sepsis, and septic shock in ICU patients.

Cut down-Annoyed-Guilty-Eye opener (CAGE), Alcohol Use Disorders Identification Test (AUDIT) questionnaires, and the Short Michigan Alcohol Screening test (short MAST) are screening tools for AWS. None of these tools have been validated and are in critically ill.[8] The revised Clinical Institute Withdrawal Assessment for alcohol scale (CIWA-Ar) and the Sedation Agitation Scale (SAS) are used as scales for assessment of symptom severity among nonintubated patients with AWS/DT.[13]

Studies done prior in critically ill patients failed to differentiate AWS from disease manifestations, as clinical features like altered vital parameters, tremors, sweating, fever, and delirium all can be part of the ongoing illness itself. However, in a patient with prior withdrawal seizure episode/ DT, there should be a low threshold to suspect AWS.[8] Respondents' ability to use any one or more of the questionnaires in their practice is low (<15%).

Given a clear lack of evidence in the ICU management of AUDs, the authors propose the use of objective tools validated in both medical and surgical patient groups in a sequential fashion. This might achieve a higher accuracy for the identification of AUDs, risk assessment of AWS, and monitoring severity. We suggest the use of PAWSS questionnaire to identify those at risk of severe AWS. This will allow for initiation of prophylactic strategies and or treatment. If and when AWS does occur, the CIWA-Ar scale was used to monitor the severity and response to therapies in nonventilated and RASS or sedation-agitation scale for ventilated patients (Fig. 1).[15] These strategies in the future could be audited or assessed with a more robust research methodology that may improve the overall process and hopefully clinical outcomes.

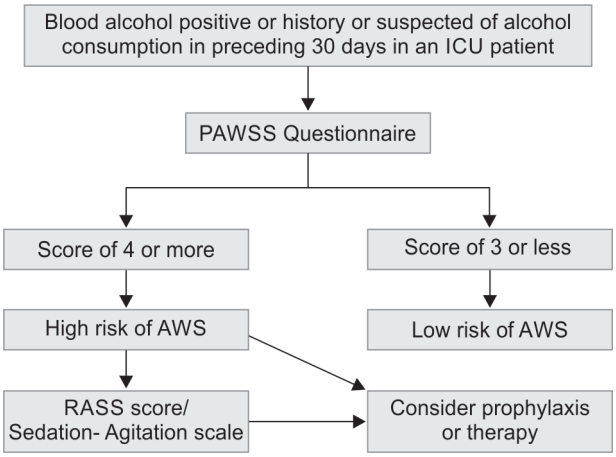

Fig. 1: AWS risk assessment

Severe AWS often needs high-dependency/intensive care unit management and results in increased length of hospital and ICU stay. Delirium associated with alcohol withdrawal can be reduced significantly from 5 to 20% to nearly 1% with appropriate identification and therapy.[16–18] This prompts the importance of diagnostic criteria awareness required by the treating physician. Our survey noted a significant finding where not a single response could identify all required criteria to diagnose AWS based on either of the DSM/ICD criteria. This knowledge gap could also be responsible for the poor identification and low predicted prevalence.

The survey also looked at the physician preferences in treatment of AWS. Benzodiazepines are considered as the first line of agents for treatment of AWS. They limit the symptoms of AWS and stop the progression of DT, but studies have been unable to show the superiority of one benzodiazepine over the others. This brings us to rationalize the choice of agent to the clinical scenario. In most patients, chlordiazepoxide and diazepam are preferred due to their controlled detoxifying properties and less chance of rebound symptoms. Lorazepam, in the absence of oxazepam, is preferred in patients with liver dysfunction. The study noted >40% respondents choosing chlordiazepoxide, and another >40% choosing lorazepam with <5% choosing diazepam. Though diazepam is as fast-acting as lorazepam and is better in some respects, the choice of lorazepam may be more due to ease of availability rather than a learned choice for the specific situation.

Various dosing regimens are used in clinical practice. Our survey again showed mixed results with a third leaning toward symptom-triggered (STR) and a third opting for fixed-dose regimen. Symptom-triggered and fixed-dose regimens are commonly used in clinical practice and predominantly in nonventilated patients. In these patients, evidence points to the use of objective tools like CIWA-Ar and dose titration. In such circumstances, STR is superior to fixed-dose loading or tapering regimens. However, with limitations of the use of CIWA-Ar in ventilated patients, a fixed-dose regimen may be a safe strategy to both prevent seizures and/or prevent progression to DT.[10,19,20]

Benzodiazepine-resistant alcohol withdrawal syndrome (BR-AWS) is understood to be a requirement of 40 mg or more of diazepam or equivalent benzodiazepines in 1 hour for symptom control of AWS.[21] The overwhelming preference for haloperidol in this survey could be due to its blanket use in ICU agitation management strategy. This could also be due to the respondent's inability to differentiate BR-AWS and DT from the survey questionnaire. Dexmedetomidine is sparingly used, and phenobarbitone rarely. BR-AWS research predominantly involved three agents (propofol, dexmedetomidine, and phenobarbital). Despite the narrow therapeutic range, only barbiturate use has been shown to reduce AWS duration or ICU length of stay. Other agents had only benzodiazepine-sparing effect. None of the above agents, with the exception of propofol, have seizure prophylaxis or control effects and some may even worsen the risk by reducing the threshold (haloperidol).[22] Identifying the underlying cause of the delirium may result in an appropriate response and, in turn, clinical outcomes, including AWS, where haloperidol could be proportionally utilized.

Only two-thirds prescribed a dose of thiamine of 300 mg or more and less than third of the respondents used a thrice-a-day perscription confirming knowledge gap. Thiamine supplementation in AWS is poorly understood and leads to varied recommendations. The reasons for the above seem to be due to the poor correlation of thiamine deficiency with the severity of AWS or neuropsychiatric complications. Animal studies and some observational studies were the basis for the reversible nature of the neuropsychiatric complications with thiamine and/or vitamin-B replacement strategies. Studies that used thiamine replacement noted higher cognitive function with a higher dose of thiamine replacement during the initial 48–72 hours but in non-ICU settings (Box 1).[23–25]

Box 1: Thiamine use in the ICU (suggested recommendation for prevention or treatment of neuropsychiatric complications)

AUDs with high risk of AWS:
- Early and parenteral therapy (prior to feeding/glucose infusions).
- In all, 300 mg in three divided doses for 3–5 days based on nutritional assessment.
- Other vitamin and magnesium corrections as appropriate.

High clinical suspicion or a diagnosis of Wernicke's encephalopathy:
- Early and parenteral therapy (prior to feeding/glucose infusions).
- In all, 500 mg of initial dose and 300 mg per day in three divided doses for at least 5 days followed by high-dose oral supplements.
- Other vitamin and magnesium corrections as appropriate.

Other vitamin supplements (vitamins B and C) and hypomagnesemia correction are suggested additions. Based on the pharmacokinetics (short half-life, translocation across the blood–brain barrier and the replacement demand) and difficulty in identifying classical neurological signs in ICU patients, a daily parenteral dose of 300–500 mg in three divided doses for a minimum of 3 days for prophylaxis and management of neuropsychiatric complications (including Wernicke's encephalopathy) is deemed safe and appropriate.[26–28]

This is one its kind research into the practice patterns in Indian ICUs to inform research needs and identify knowledge gaps. Respondents are full-time critical care clinicians from all areas of India. As with any digital survey, low response rate and biases involved are inherent to the project. Efforts to optimize the questionnaire in phases may make these biases have less effect on objective administration and findings. The surgical, neurosurgical, or neurological ICU-specific respondents are sparse, making that subgroup analysis difficult. The pragmatic nature of the survey is enhanced by having clinicians choose from multiple-choice responses.

Conclusion

The survey reported a lower prevalence compared with international literature. Insurance rejection is one of the main factors in limiting adequate history taking or documenting AUDs. AWS risk assessment, monitoring, and management are variable and suboptimal. Variability in all aspects of AUDs is attributable to the knowledge gap. Due to the lack of reliable means to assess AWS risk and monitor their progress in the ICU, and in particular, in those mechanically ventilated, the authors propose abbreviated and sequential use of objective tools to improve accuracy. Further, high-quality studies in ICU patients are required to bridge the research gap.

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