Alcohol Withdrawal in the ICU: Practice and Pitfalls

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It is not uncommon for the practicing intensivist to be asked to care for patients who present with alcohol withdrawal syndrome (AWS). Though the basic management can be straightforward, the presence of numerous medical comorbidities and the development of iatrogenic and nosocomial complications can often make management much more challenging and complex. The focus of this article is to facilitate clinician comprehension of the current approach to alcohol withdrawal and to outline optimal use of pharmacological interventions to prevent untoward outcomes.

Who Is at Risk?
ICU clinicians must keep the possibility of alcohol withdrawal in mind at all times, regardless of the type of intensive care unit (ICU). While AWS is most frequent in medical ICUs, it also may emerge in surgical, neurosurgical and cardiothoracic settings. Unexplained changes in mental status, hemodynamics or body temperature should make the critical care clinician suspicious of the possibility of AWS. Conversations on the topic with the patient and family, though important, may be of limited value and should not be used to “rule out” the possibility of AWS. Nevertheless, it is important to obtain a history of recent drinking, including frequency, amount and time of last drink, as well as past history of withdrawal or seizures, hallucinosis or delirium tremens (DTs). Also necessary is the history of concurrent use of other illicit drugs, as well as benzodiazepines or barbiturates, as they may increase tolerance and risk of serious withdrawal phenomena. The spectrum of alcohol withdrawal can range from simple tremulousness and anxiety to seizure, frank DTs, and death. It is important to distinguish between DTs and alcoholic hallucinosis (AH) (where the sensorium is intact).(1) AH is characterized by visual, auditory or tactile hallucinations. Patients with chronic alcohol use are at high risk for alcohol withdrawal seizures, which usually occur between 6 and 48 hours after decreasing alcohol use.(2)

DTs can be seen between 48 to 96 hours after cessation of alcohol consumption. Factors that place individuals at highest risk include: 1) a prolonged drinking history; 2) previous occurrence of DTs; 3) age >30 years; 4) comorbid illness; and 5) increasing number of days since the last drink. Associated mortality can be as high as 15%. Symptoms include tachycardia, hypertension, fever, diaphoresis, agitation and delirium. Risk factors for worse outcome with DTs include older age, lung disease, temperature >104°F, and significant hepatic dysfunction.(1) These patients can develop considerable dehydration, decreased cerebral blood flow (secondary to respiratory alkalosis), and profound hypokalemia, hypomagnesemia, and hypophosphatemia.

General Medical Therapy for AWS
General therapy should include: 1) ensuring that the patient is well hydrated; 2) correcting all electrolyte imbalances (including potassium, calcium, and magnesium); 3) providing thiamine, folate, and multivitamin supplementation; and 4) instituting routine nursing seizure prophylaxis if a history of seizures is present. To prevent the dreaded complications of thiamine deficiency – Wernicke’s encephalopathy, with its classic triad of encephalopathy, oculomotor dysfunction, and gait ataxia – early and routine delivery of thiamine should be provided to these patients.(4) Thiamine should always be given before glucose in patients at risk for this syndrome. Korsakoff’s amnestic syndrome is characterized by selective anterograde and retrograde amnesia; it is a late manifestation of Wernicke’s encephalopathy.

Benzodiazepines: Symptom Triggered vs. Fixed Dose
A landmark study in 1994 demonstrated that by using symptom-triggered therapy for AWS (rather than a fixed schedule), patients required a shorter duration of therapy and decreased amount of medication.(5, 6) (see Table 1) This approach requires careful and frequent monitoring with a validated withdrawal-symptom scale, such as the Clinical Institute Withdrawal Assessment for Alcohol (CIWA Ar).
The categories on this scale are sweating, anxiety, tremor, auditory or visual disturbances, agitation, nausea and vomiting, tactile disturbances, headache and orientation. The maximum possible score is 67, and symptom scores of more than 15 on this scale or a history of withdrawal seizures indicates that medications should be started at presentation.

**Adjunctive Therapy**

Multiple agents have been used to help ameliorate some of the symptoms of AWS – primarily autonomic dysfunction – but none have been shown to be superior to the others. These agents include beta-blockers, alpha-agonists, neuroleptics, carbamazepine, and even ethyl alcohol infusions. A recent randomized trial demonstrated no benefit of ethanol infusions over benzodiazepine therapy. Carbamazepine seems to be superior to placebo and appears to reduce the more severe responses seen in patients with prior episodes of AWS (“kindling effect”). Caution must be applied when using these adjunctive agents, as they may mask early signs of withdrawal.

**Tapering Therapies**

Once the patient has been stabilized for 24 hours, consider reducing the total 24-hour dose by 25% each day over the next two to three days. A change to oral benzodiazepines should be attempted as soon as it is safe. As described earlier, however, research has pointed out the benefits of symptom-triggered therapy rather than standing agents for patients with AWS.

**Table 2. Protocol for Symptom-Triggered Management of AWS Using CIWA-Ar**

<table>
<thead>
<tr>
<th>Severity based on CIWA-Ar Score</th>
<th>Initial Dosing</th>
<th>Subsequent Dosing</th>
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<tbody>
<tr>
<td>Mild (8-15)</td>
<td>Chlordiazepoxide PO 50 mg Q1H x 2 hours</td>
<td>Select a single agent for initial dosing and titrate as needed to control symptoms and avoid excessive sedation. CIWA-Ar assessment by nursing every four hours Subsequent dosing occurs as needed for CIWA-Ar &gt;8</td>
</tr>
<tr>
<td></td>
<td>Lorazepam PO/SL/I 1-2 mg</td>
<td>Sedation assessment 1 hour after oral medications and 15 minutes after parenteral medications Dosing is held for excessive sedation Once stabilized, reduce the total daily dose by 25% daily over 2-3 days</td>
</tr>
<tr>
<td>Moderate (16-25)</td>
<td>Chlordiazepoxide PO 100 mg Q1H x 2 hours</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lorazepam PO/SL/I 3-4 mg</td>
<td></td>
</tr>
<tr>
<td>Severe (&gt;25)</td>
<td>Lorazepam IV 2-4 mg Q15-30 min x 6 hours</td>
<td>Subsequent dosing occurs as above Transfer to a monitored setting/Intensive care unit CIWA-Ar and vital signs assessment by nursing every two hours Sedation assessment 15 minutes after each parenteral dose Dosing is held for excessive sedation Consider continuous benzodiazepine/propofol infusion if frequent boluses are required</td>
</tr>
</tbody>
</table>

Adapted with permission from JAMA. Pharmacological management of alcohol withdrawal: A meta-analysis and evidence-based practice guideline. 1997;278:144.

**Conclusions**

The critical care practitioner must keep in mind that up to 15% of patients presenting to the hospital may have alcohol-use disorders and alcohol related health problems. The intensivist may be caring for these patients primarily for issues of DTs in the ICU or for manifestations of AWS after planned surgery. General medical interventions, such as treatment of dehydration and electrolyte derangements, must be stressed. Thiamine (most importantly) and folate are to be provided to all patients deemed at risk for AWS to prevent dire complications. Symptom-triggered therapy guided by a scale such as CIWA-Ar appears to be superior to fixed-dose therapy with benzodiazepines. Adjunctive therapies can alleviate symptoms, but may mask the syndrome, and clearly should not be used as monotherapy. If the patient requires ICU care, there is a significant likelihood that intubation and prolonged therapy with benzodiazepines or propofol will be needed.

**References:**


**Disclosures:**

*Author has no disclosures to report

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