

Acute alcohol toxicity and withdrawal in the emergency room and medical admissions unit

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ABSTRACT

Alcohol-related hospital attendances and admissions continue to escalate despite a fall in alcohol consumption levels in the UK population overall. People with alcohol-related problems pose a significant and often disproportionate burden on acute medical services as their management is often complex and challenging. This article focuses on the management of alcohol intoxication, with particular emphasis on aggressive and possibly violent behaviour; alcohol withdrawal; fitting; and the prevention and treatment of Wernicke's encephalopathy.

Introduction

People with alcohol problems are frequent attendees at accident and emergency departments and medical admission units. They manifest a wide range of problems, including alcohol intoxication, alcohol withdrawal and fitting, and aggressive and sometimes violent behaviour. In addition, they may have a whole host of other alcohol-related physical and psychosocial problems. Management of these individuals needs skill, knowledge and fortitude. However, opportunities should not be lost, whether patients are admitted or not, to assess their needs and refer appropriately to alcohol liaison services or other statutory/non-statutory bodies.

Alcohol intoxication

In naïve drinkers, blood alcohol concentrations of 150–250 mg/100 ml are usually associated with clinically apparent intoxication; concentrations of 350 mg/100 ml are associated with stupor and coma; while concentrations of >450 mg/100 ml are often fatal. Individuals who habitually misuse alcohol often develop tolerance to its effects and are significantly less likely to develop intoxication than non-habitual drinkers.

Adults with mild to moderate intoxication can be managed satisfactorily in relatively simple surroundings with a minimum of medical support, but those who are severely intoxicated should be admitted and nursed in a high-dependency setting. Their level of consciousness should be assessed at least hourly;

their cardiac activity should be continuously monitored; their urine output should be carefully recorded; and blood glucose, plasma electrolytes and blood gases should be measured every 4 hours until recovery is assured.

Intravenous fluids should be given to counter dehydration and to maintain urine output and plasma expanders may be required if circulatory collapse occurs; inotropic support may be necessary if severe hypotension persists. Hypoglycaemia should be corrected as quickly as possible with oral glucose, if the conscious level permits, or else with 5% or 10% IV dextrose, as required. Assisted ventilation may be needed if respiration is severely depressed. Haemodialysis may have a place in the management of individuals with exceptionally high blood alcohol concentrations, particularly if there are other metabolic complications, evidenced by an arterial pH of <7, or if other dialysable drugs have been ingested.

Key points

Alternative causes of impaired consciousness should be sought in adults with blood alcohol levels below 350 mg/100 ml.

Aggressive, intoxicated individual should be assessed, if possible, to identify factors such as injury or infection which might confound the clinical picture.

Individuals who are alcohol dependent should be admitted to hospital for assisted withdrawal if they have previously experienced severe withdrawal symptoms, have a history of fitting, significant comorbidities or complex social needs.

Fitting is associated with both alcohol intoxication and alcohol withdrawal and is best managed with benzodiazepines; prophylactic anti-epileptic medication should not be given.

Maintain a low threshold for provision of prophylactic thiamine supplementation to patients with alcohol problems, particularly those who are malnourished, have comorbid liver disease or are withdrawing from alcohol.

KEYWORDS: Alcohol intoxication, alcohol withdrawal, aggression, benzodiazepines, fitting, thiamine, Wernicke's encephalopathy ■

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Table 1. Features of acute alcohol withdrawal.

Type	Onset ^a	Features	Offset	Fitting	Other features
Minor symptom complex (majority)	6–8 h	Generalised hyperactivity, anxiety, tremor, sweating, nausea, retching, tachycardia, systemic hypertension, mild pyrexia (Peak 10–30 h)	40–50 h	Yes: first 12–48 h	Auditory/visual hallucinations: may last for 5–6 days
Delirium tremens (<5%)	48–72 h	Coarse tremor, agitation, fever, tachycardia, profound confusion, delusions and hallucinations	Fatal if not effectively treated	No: may herald the syndrome but is not part of it	Hyperpyrexia, ketoacidosis and profound circulatory collapse if not effectively curtailed

^afollowing abrupt cessation or a substantial reduction in alcohol intake.

Several further complications can arise which will need additional skilled management; these include ketoacidosis, lactic acidosis, cardiac arrhythmias, hypokalaemia, inhalation pneumonia, venous thromboembolism and hyperpyrexia; hypoglycaemia may be delayed for up to 36 hours and is easily missed.

Alternative or additional causes for the change in conscious level should also be sought in adults who present in coma with blood alcohol concentrations of <350 mg/100 ml. Cerebral trauma, cerebrovascular events and meningitis should be excluded, as far as possible. The presence of narcotic or other sedative drugs should be considered and information sought from the National Poisons Information Service (NPIS) in the UK and the National Poisons Information Centre in Ireland (NPIC). This service is accessed via www.toxbase.org and is freely available to UK NHS hospitals and general practices, NHS Departments of Public Health and HPA units. Severe or complex cases, including multiple ingestions and people with significant comorbidity, can be discussed with the relevant poisons service: UK NPIS 0844 892 0111; Ireland NPIC (01) 809 2566. Clinicians treating women who are pregnant can contact the UK Teratology Information Service 0844 892 0909.

Metadoxine (pyridoxal L-2-pyrrolidine-5-carboxylate) has been shown to accelerate the elimination of alcohol in adults leading to faster recovery from intoxication and a more controlled withdrawal from alcohol.^{1–3} It is given as a single intravenous administration and has few, if any, side-effects. This product is not, however, licensed for use in the UK.

The aggressive intoxicated drinker

Although most intoxicated patients are cooperative, some may be belligerent, abusive and violent. The overriding priority in this situation is to ensure the patient's safety and that of attending staff, relatives/friends and bystanders. It is equally important to try to assess whether the patient is aggressive and disinhibited simply because they are intoxicated or because other factors, such as injury or infection, have added a component of confusion or delirium.

Every attempt should be made to create a calm environment. Those not immediately concerned with the patient's management should be asked to leave. Ensure that the room is clear of objects that can be thrown or used as weapons and that staff can exit easily and safely, if necessary. Try to defuse escalating anger by adopting a concerned and non-threatening

demeanour. Remember there is little point in arguing with someone who is very drunk.

Many hospitals have security staff and police on standby; they should be summoned promptly if initial attempts to defuse the situation fail. Their intervention is rarely necessary but their presence is important to convey a clear message that violence will not be tolerated.

The patient should be offered 'something to calm them down'; sedatives should be used sparingly because of the danger of oversedation in an intoxicated patient and of masking other conditions affecting cerebral function. If the patient refuses help and their aggression continues to escalate it is probably best to try to isolate them in a safe environment rather than to forcibly restrain and sedate them. Restraint, if eventually necessary, should be undertaken by staff trained in the correct procedures. The drug of choice in this situation is haloperidol, administered parenterally. Subsequent, careful monitoring will be required, watching specifically for features of alcohol withdrawal.

If the patient is mentally ill, confused, disorientated, suicidal or significantly depressed then detention under the Mental Health Act may be needed; however, this is not justified in most situations of intoxication and aggressive behaviour.

Alcohol withdrawal effects

Approximately 40% of individuals who misuse alcohol will develop an acute withdrawal syndrome when they abruptly

Box 1. High-risk patients who should be considered for admission to hospital for medically assisted withdrawal from alcohol.

- > History of seizures or delirium tremens during previous attendances/admissions.
- > Significant or multiple comorbidities eg severe chronic depression, psychosis, unstable angina, heart failure, chronic liver or renal disease, malnutrition
- > Significant learning difficulties or cognitive impairment
- > Inadequate social support
- > Age <18 years
- > Older persons particularly if also frail
- > Pregnant women
- > Homeless persons

Table 2. Sample fixed dose regimen for treatment of alcohol withdrawal with chlordiazepoxide.

Time	Dosage
Day 1, ie first 24 h	30 mg qds
Day 2	20 mg tds 30 mg nocté
Day 3	10 mg tds 20 mg nocté
Day 4	5 mg tds 10 mg nocté
Day 5	5 mg mane 10 mg nocté
Day 6	5 mg nocté
THEN STOP	
A variable 5–10 mg 'prn' dose can be prescribed for breakthrough symptoms occurring during the withdrawal period	

stop or substantially reduce their alcohol intake. Most patients manifest a 'minor symptom complex or syndrome', while a relatively small proportion develop delirium tremens which, if untreated, can be fatal (Table 1).

Not all patients attending acute services with features of alcohol withdrawal need to be admitted. The decisions around this are complex and primarily driven by local practices and facilities. Some patients in early withdrawal, with no other risk factors, can be referred to alcohol liaison services and their withdrawal managed in the community. Clearly admission is mandatory for patients with symptoms of severe alcohol withdrawal, fitting and established delirium tremens. Admission is also recommended for patients thought to be at particular risk, including those who have a history of fitting, significant comorbidities or complex social needs (Box 1).^{4,5}

Medically assisted withdrawal from alcohol is generally managed using a fixed-dose regimen of benzodiazepines. The benzodiazepines differ little in efficacy from one another but the longer acting drugs, diazepam and chlordiazepoxide, have a smoother more protracted effect. However, accumulation may cause problems in patients with respiratory or hepatic impairment. The shorter acting drugs have little tendency to accumulate but their use is associated with a higher incidence of fitting. The drug of choice is given in high dosage on days 1–3 and is then tapered over the next 4–7 days in response to the patient's condition. Patients' needs are extremely variable and so the dosage of medication is difficult to predict accurately. As a guide, the daily dosages commonly employed in the early phase of treatment might be diazepam 40 mg, chlordiazepoxide 120 mg and lorazepam 8 mg. After the third day, dose reduction of at least 25% daily is required (Table 2).

Consideration can be given, in settings where 24-hour assessment and monitoring are available, for adoption of a symptoms-triggered withdrawal regimen tailored to the individual patient's needs; patients are assessed at set time points and drug treatment provided if they need it, but withheld if they are comfortable/without symptoms.

Convulsions can be treated with intravenous diazepam in a dose of 0.15–0.25 mg/kg body weight (usually 10–20 mg) every

Box 2. Treatment of Wernicke–Korsakoff syndrome.

A presumptive diagnosis of Wernicke–Korsakoff syndrome should be made in patients with a history of alcohol misuse and one or more of the following otherwise unexplained symptoms:

- > ataxia
- > ophthalmoplegia
- > nystagmus
- > hypotension
- > memory disturbance
- > comatosed/unconscious
- > confusion
- > hypothermia

Treat with the following:

- > IV high-potency Pabrinex[®] tds for three days
- > dilute ampoules 1 and 2 with 50–100 ml normal saline or 5% glucose and infuse over 15–30 minutes
- > flush the giving set with at least 50–100 ml normal saline or 5% glucose at the end of the infusion.

NO RESPONSE: discontinue and reassess.

RESPONSE: IV Pabrinex[®] od IV for five days or until no further improvement: then oral supplements for 2–4 weeks.

4 hours by slow intravenous injection or infusion. Diazemuls (diazepam emulsion injection) is preferred to plain diazepam as it is less likely to cause thrombophlebitis. Lorazepam, given in a dose of 2–4 mg (0.7 µg/kg; maximum 4 mg) by rapid bolus injection, is an alternative. Hallucinations may require treatment with lorazepam, haloperidol or olanzapine. Delirium tremens is best managed with lorazepam which may need to be given parenterally; haloperidol and olanzapine are alternatives.

Care must be taken to maintain the patient's general condition during the withdrawal period. Dehydration should be corrected by use of oral fluids; intravenous fluids should be avoided as overhydration is a serious potential hazard. Several biochemical abnormalities may be observed during the withdrawal period, for example, hypokalaemia and hypomagnesaemia, but these are usually transient and do not need specific correction; more persistent abnormalities will need to be corrected appropriately.

Fitting

Individuals who misuse alcohol may develop fitting when intoxicated. Fitting may also develop in alcohol-dependent individuals when they withdraw from alcohol. The fits should be brought under control with parenteral benzodiazepines but with great care as the blood alcohol concentration may still be significantly elevated. An electroencephalogram should be undertaken in all individuals experiencing this type of fitting for the first time, together with some form of cerebral imaging, either CT or MRI, in order to exclude potential underlying pathology. There is no indication for use of prophylactic anti-epileptic medication in this setting.

Individuals who chronically misuse alcohol may suffer head trauma resulting in cerebral injury or subdural/

Table 3. Recommended regimens for prophylactic vitamin supplementation in alcohol misusers.

Situation	Regimen
<ul style="list-style-type: none"> > Well nourished > No history of dietary neglect > Adequate dietary intake > No neuropsychiatric symptoms/signs 	No need for additional supplements but monitor
<ul style="list-style-type: none"> > Mild malnutrition > At risk of malnutrition > Compensated cirrhosis > Acute alcohol withdrawal 	Oral thiamine hydrochloride: 100 mg tds for 2–4 weeks
<ul style="list-style-type: none"> > Moderate/severe malnutrition > Significant dietary neglect > Poor/negligible dietary intake > Peripheral neuropathy > Decompensated cirrhosis > Severe acute withdrawal 	IV Pabrinex® bd for three days then oral supplementation for 2–4 weeks

extradural haematomas. These injuries may result in fitting, either at the time of the initial insult, or subsequently. These individuals are extremely difficult to manage. They may require long-term, antiepileptic medication but, if they continue to misuse alcohol, control may be difficult, if not impossible, to achieve.

Wernicke's encephalopathy

Individuals with alcohol problems are often thiamine deficient and are therefore at risk for developing Wernicke–Korsakoff syndrome. The classical triad of ophthalmoplegia, ataxia and confusion is rarely seen and a high threshold of suspicion should be maintained in patients with otherwise unexplained neurological findings (Box 2). Thiamine supplementation is required, and invariably provided in the UK, as the mixed vitamin preparation Pabrinex®. However, there is little or no evidence base on which to determine the dose, frequency, route or duration of thiamine treatment for prophylaxis against or treatment of Wernicke–Korsakoff syndrome in this setting.⁶ Several sets of guidance exist based primarily on pragmatic clinical consensus,^{4,7,8} resulting in a lack of consistency, confusion and poor uptake of best practice.^{9,10}

If there is any suspicion of Wernicke's encephalopathy treatment should be instituted promptly (Box 2). Prophylactic vitamin supplementation should also be prescribed in individuals identified as at risk with the dosage and route varied in relation to the perception of risk severity. It is not clear how long treatment should be continued to ensure adequate replenishment of thiamine stores – a safe margin should be allowed (Table 3).

Caution should be exercised when adopting the recommended practice of giving one dose of parenteral Pabrinex® to individuals attending acute services.⁷ Provision might mask

the signs of impending Wernicke's with possible disastrous consequences making it vital that the patient is also given an adequate supply of oral thiamine supplementation to take away with them and clear advice about the need for compliance.

Summary

Patients with alcohol problems presenting to accident and emergency department and medical admissions unit are challenging and their management, as a consequence, is often suboptimal. These patients should be reviewed, and their management directed, by members of staff with relevant experience rather than by departmental juniors. Guidelines exist for the management of these patients, which can be modified to reflect local preferences and services, and should be used to facilitate application of best practice. ■

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