

Alcohol Withdrawal Syndrome & CIWA Assessment

Alcohol Withdrawal Syndrome is a set of symptoms that can occur when an individual reduces or stops alcoholic consumption after long periods of use. Prolonged and excessive use of alcohol leads to tolerance and physical dependence. The withdrawal syndrome is largely a hyper-excitability response of the central nervous system to lack of alcohol. Symptoms typical of withdrawal include agitation, seizures, and delirium tremens.

Sedative-hypnotics, such as alcohol, are well known for their propensity to induce physiological dependence. This dependence is due to alcohol-induced neuro-adaptation. Withdrawal is characterized by neuropsychiatric excitability and autonomic disturbances. Dependence on other sedative-hypnotics can increase the severity of the withdrawal syndrome.

Signs & Symptoms:

Signs and symptoms of alcohol withdrawal occur primarily in the central nervous system. The severity of withdrawal can vary from mild symptoms such as sleep disturbances and anxiety to severe and life-threatening symptoms such as delirium, hallucinations, and autonomic instability.

Withdrawal usually begins 6 to 24 hours after the last drink. It can last for up to one week. To be classified as alcohol withdrawal syndrome, patients must exhibit at least two of the following symptoms: increased hand tremor, insomnia, nausea or vomiting, transient hallucinations (auditory, visual or tactile), psychomotor agitation, anxiety, tonic-clonic seizures, and autonomic instability.

The severity of symptoms is dictated by a number of factors, the most important of which is degree of alcohol intake, length of time the individual has been using alcohol, and previous history of alcohol withdrawal. Symptoms are also grouped together and classified:

- Alcohol hallucinosis: patients have transient visual, auditory, or tactile hallucinations, but are otherwise clear.
- Withdrawal seizures: seizures occur within 48 hours of alcohol cessation and occur either as single generalized tonic-clonic seizure or as a brief episode of multiple seizures.
- Delirium tremens: hyper-adrenergic state, disorientation, tremors, diaphoresis, impaired attention/consciousness, and visual and auditory hallucinations. This usually occurs 24 to 72 hours after alcohol cessation. Delirium tremens is the most severe form of withdrawal and occurs in 5 to 20% of patients experiencing detoxification and 1# of patients experiencing withdrawal seizures.

Progression:

Typically the severity of the symptoms experienced will depend on the amount and duration of prior alcohol consumption, as well as the number and severity of previous withdrawals. Even the most severe of these symptoms can occur in as little as 2 hours after cessation; therefore, the overall unpredictability necessitates either pre-planned hospitalization, treatment coordinated with a doctor, or at the very least fast access to medical care and a supporting system of friends or family should be introduced prior to addressing detoxification. In many cases, however, symptoms follow a reasonably predictable time frame as exemplified below:

Six to 12 hours after the ingestion of the last drink, withdrawal symptoms such as shaking, headache, sweating, anxiety, nausea or vomiting occur. Other comparable symptoms may also exist in this period.

Twelve to 24 hours after cessation, the condition may progress to such major symptoms as confusion, hallucinations (with awareness of reality), tremor, agitation, and similar ailments. It's between the 24 and 48 hour period that seizures typically may begin to emerge among the previous symptoms in the period, and this is where the serious risk of mortality begins. Although most often, the condition begins to improve past the 48 hour mark, it can sometimes continue to increase in severity to delirium tremens, characterized by hallucinations that are indistinguishable from reality, severe confusion, more seizures, high blood pressure and fever which can persist anywhere from 4 to 12 days.

Protracted Withdrawal:

A protracted alcohol withdrawal syndrome occurs in many alcoholics where withdrawal symptoms continue beyond the acute withdrawal stage but usually at a subacute level of intensity and gradually decreasing with severity over time. This syndrome is also sometimes referred to as the post-acute withdrawal syndrome. Some withdrawal symptoms can linger for at least a year after discontinuation of alcohol. Symptoms can include a craving for alcohol, inability to feel pleasure from normally pleasurable things (also known as anhedonia), clouding of sensorium, disorientation, nausea and vomiting or headache. Insomnia is also a common protracted withdrawal symptom which persists after the acute withdrawal phase of alcohol. Insomnia has also been found to influence relapse rate. Studies have found that magnesium or trazadone can help treat the persisting withdrawal symptom of insomnia in recovering alcoholics. Insomnia can be difficult to treat in alcoholics because many of the traditional sleep aids (e.g. benzodiazepine receptor agonists and barbiturate receptor agonists) work via a GABA-A receptor mechanism and are cross tolerant with alcohol. However, trazadone is not cross tolerant with alcohol. The acute phase of the alcohol withdrawal syndrome can also occasionally be protracted. Protracted delirium tremens has been reported in the medical literature as a possible but unusual feature of alcohol withdrawal.

Pathophysiology:

Chronic use of alcohol leads to changes in brain chemistry, especially in the GABAergic system. Various adaptations occur such as changes in gene expression and down regulation of GABA-A receptors. During acute alcohol withdrawal, changes also occur such as up-regulation of alpha4-containing GABA-A receptors and down regulation of alpha1 and alpha3-containing GABA-A receptors. Neurochemical changes occurring during alcohol withdrawal can be minimized with drugs which are used for acute detoxification. With abstinence from alcohol and cross tolerant drugs, these changes in neurochemistry gradually return towards normal. Adaptations to the NMDA system also occur as a result of repeated alcohol intoxication and are involved in the hyper-excitability of the central nervous system during the alcohol withdrawal syndrome. Homocysteine levels which are elevated during chronic drinking increase even further during the withdrawal state and may result in excitotoxicity. Alterations in ECG, in particular an increase in the QT interval, and EEG abnormalities may occur during early withdrawal. Dysfunction of the hypothalamic-pituitary-adrenal axis and increased release of corticotropin-releasing hormone occur during both acute as well as protracted abstinence from alcohol and contribute to both acute and protracted withdrawal symptoms. Anhedonia/dysphoria symptoms, which can persist as part of a protracted withdrawal, may be due to dopamine underactivity.

Kindling:

Kindling is a phenomenon where repeated alcohol detoxifications lead to an increased severity of the withdrawal syndrome. For example, binge drinkers may initially experience no withdrawal symptoms, but with each period of alcohol use followed by cessation, their withdrawal symptoms intensify in severity and may eventually result in full-blown Delirium Tremens with convulsive seizures. Alcoholics who experience seizures during detoxification are more likely to have had previous episodes of alcohol detoxification than patients who did not have seizures during withdrawal. In addition, patients with previous withdrawal syndromes are more likely to have more medically-complicated alcohol withdrawal symptoms.

Kindling can cause complications and may increase the risk of relapse, alcohol-related brain damage, and cognitive deficits. Chronic alcohol misuse and kindling via multiple alcohol withdrawals may lead to permanent alterations in the GABA-A receptors. The mechanism behind kindling is sensitization of some neuronal systems and desensitization of other neuronal systems which leads to increasingly gross neurochemical imbalances. This in turn leads to more profound withdrawal symptoms including anxiety, convulsions and neurotoxicity.

Binge drinking is associated with increased impulsivity, impairments in spatial working memory and impaired emotional learning. These adverse effects are believed to be due to the neurotoxic effects of repeated withdrawal from alcohol on aberrant neuronal plasticity and cortical damage. Repeated periods of acute intoxication followed by acute detoxification has profound effects on the brain and is associated with an increased risk of seizures as well as cognitive deficits. The effects on the brain are similar to those seen in alcoholics who have been detoxified multiple times but not as severe as in

alcoholics who have no history of prior detox. Thus the acute withdrawal syndrome appears to be the most important factor in causing damage of impairment to brain function. The brain regions most sensitive to harm from binge drinking are the amygdala and prefrontal cortex.

People in adolescence who experience multiple withdrawals from binge drinking show impairments of long-term nonverbal memory. Alcoholics who have had two or more alcohol withdrawals show more frontal lobe cognitive dysfunction than alcoholics who have experienced one or no prior withdrawals. Kindling of neurons is the proposed cause of withdrawal related cognitive damage. Kindling from multiple withdrawals leads to accumulating neuroadaptational changes. Kindling may also be the reason for cognitive damage seen in binge drinkers.

Treatment:

Benzodiazepines are effective for the management of symptoms as well as the prevention of seizures. Certain vitamins are also an important part of the management of alcohol withdrawal syndrome. In those with severe symptoms inpatient care is often required. In those with lesser symptoms treatment at home may be possible with daily visits with a health care provider.

Benzodiazepines:

Benzodiazepines are the most commonly used medication for the treatment of alcohol withdrawal and are generally safe and effective in suppressing symptoms of alcohol withdrawal. This class of medications are generally effective in symptoms control, but need to be used carefully. Although benzodiazepines have a long history of successfully treating and preventing withdrawal, there is no consensus on the ideal one to use. The most commonly used agents are long-acting benzodiazepines, such as chlordiazepoxide and diazepam. These are believed to be superior to other benzodiazepines for treatment of delirium and allow for longer periods between dosing. However, benzodiazepines with intermediate half-lives like lorazepam may be safer in people with liver problems.

The primary debate between use of long-acting benzodiazepines and short-acting is that of ease of use. Longer-acting drugs, such as diazepam, can be dosed less frequently. However, evidence does exist that “symptom-triggered regimens” such as those used when treating with lorazepam, are as safe and effective, but have decreased treatment durations and medication quantity used.

Although benzodiazepines are very effective at treating alcohol withdrawal, they should be carefully used. Benzodiazepines should only be used for brief periods in alcoholics who are not already dependent on them, as they share cross tolerance with alcohol. There is a risk of replacing an alcohol addiction with benzodiazepine dependence or adding an additional addiction. Furthermore, disrupted GABA benzodiazepine receptor function is part of alcohol dependence and chronic benzodiazepines may prevent full recovery from alcohol induced mental effects. The combination of benzodiazepines and alcohol can amplify the adverse psychological effects of each other, causing enhanced depressive effects on mood and increase suicidal actions and are generally contraindicated except for alcohol withdrawal.

Vitamins:

The prophylactic administration of thiamine intravenously is recommended before starting any carbohydrate containing fluids or food. Alcoholics are often deficient in various nutrients which can cause severe complications during alcohol withdrawal such as the development of Wernicke syndrome. The vitamins of most importance in alcohol withdrawal are thiamine and folic acid. To help to prevent Wernicke syndrome, alcoholics should be administered a multivitamin preparation with sufficient quantities of thiamine and folic acid. Vitamins should always be administered before any glucose is administered otherwise Wernicke syndrome can be precipitated.

CIWA Assessment Scale:

Many quantification instruments have been developed for monitoring alcohol withdrawal. No single instrument is significantly superior to the other; however, what is clear is that there are significant clinical advantages to quantifying the alcohol withdrawal syndrome. Quantification is key to preventing excess morbidity and mortality in a group of patients who are at risk for alcohol withdrawal. Such instruments help clinical personnel recognize the process of withdrawal before it progresses to more advanced stages, such as Delirium Tremens. By intervening with appropriate pharmacotherapy in those patients who require it, while sparing the majority of patients whose syndromes do not progress to that point, the clinician can prevent over- and under-treatment of the alcohol withdrawal syndrome. Finally, by quantifying and monitoring the withdrawal process, the treatment regimen can be modified as needed.

The best known and most extensively studied scale is the Clinical Institute Withdrawal Assessment-Alcohol (CIWA). This scale has well-documented reliability, reproducibility, and validity, based on comparison to ratings by expert clinicians. From 30 signs and symptoms, the scale has been carefully refined to a list of 10 signs and symptoms. The CIWA scale is thus easy to use and has been shown to be feasible to use in a variety of clinical settings, including detoxification units, psychiatry units, and general medical/surgical wards. The CIWA has added usefulness because high scores, in addition to indicating severe withdrawal, are also predictive of the development of seizures and delirium.

The CIWA scale can measure 10 symptoms. Scores of less than 8 indicate minimal to mild withdraw. Score of 8 to 15 indicate moderate withdrawal (marked autonomic arousal); and scores of 15 or more indicate severe withdrawal (pending Delirium Tremens). The assessment requires approximately two minutes to perform.