Delirium tremens is a potentially fatal complication of alcohol addiction. In this report, the author describes a case of delirium tremens that occurred during the administration of anesthesia and discusses the use of intravenous alcohol in reversing the process.

A 23-year-old male was brought into the emergency room with a traumatic amputation of the distal right leg and extensive burns and crushing injuries of the right hand. Upon admission, he was intoxicated with alcohol. He had no other injuries, and his parents gave no history of any other health problems except his ethanol intake which was greater than one quart per day of hard spirits. His blood alcohol level, taken on admission, was later reported as 370 mgms %. (A lethal dose is between 400 mgms % and 500 + mgms %.) He was taken to surgery for debridement and closure of his wounds; the anesthetic was carried with oxygen 2L/min., nitrous oxide 2L/min., increments of morphine sulfate totaling 25 mgs, and pancuronium 4 mgs. Ventilation was controlled throughout the case.

During the first hour the anesthetic progressed normally and the vital signs remained stable. At that point, however, the patient's vital signs began to rise rather abruptly; within a 30-minute period the blood pressure rose from 130 to over 150. Most distressing was the temperature, which rose to 104.4° rectally.

Blood was drawn for stat CPK and blood gases. Cooling was started with a cooling blanket, iced Ringers lactate intravenously, and an alcohol sponge bath. After blood cultures were drawn, an infusion of 5% alcohol was started with 250 cc being administered within the first half hour.

Within a 15-minute period of starting the alcohol drip, blood pressure, pulse and temperature all started to return to normal. The operation was prematurely terminated. By the time the patient was admitted to the recovery room 45 minutes later, all vital signs were normal except the temperature, which had fallen to 101.0° rectally. The day following surgery this, too, was back to normal.
Delirium tremens, first described by Sutton in 1813, is one of the most serious complications of alcohol addiction and may come on suddenly or develop slowly over time. It is characterized in the conscious patient by hallucinations, confusion, agitation, sleeplessness and increased activity of the sympathetic nervous system, including dilated pupils, tachycardia, hypertension, hyperpyrexia and profuse perspiration. In the anesthetized patient these signs may be hidden except for the sympathetic activity. The mortality rate varies in different studies between 1.3% and 37% and appears to be substantially higher when in combination with a hyperpyrexia in excess of 104°F.

Delirium tremens is brought on by a rapidly decreasing blood alcohol level in alcoholics but the exact pathophysiological mechanism is unknown. Severe symptoms may result after consuming 25 to 30 ozs. of 100 proof alcohol daily for three months. Withdrawal symptoms usually occur 12 to 72 hours after cessation of drinking. The patient in this case admitted to heavy drinking since the age of 18, and had been in the hospital approximately 40 hours at the time of his second anesthetic.

During this case, when the temperature became elevated, malignant hyperthermia was first considered. The CPK was reported back as 941 IU/L and although this would normally signify malignant hyperthermia, this diagnosis was ruled out for the following reasons: 1) the blood gases were normal, 2) the heart was always in a pure sinus tachycardia without extra beats or arrhythmias, 3) the temperature and other vital signs responded rapidly to rather minimal cooling measures, and 4) the patient was a trauma victim, which could explain the abnormally high CPK.

Also considered were bacteremia and delirium tremens. Bacteremia seemed unlikely as the operative area was occluded from the general circulation with a tourniquet. The blood cultures that were drawn later reported no growth, definitely ruling out a bacteremia. With the patient’s history of alcohol abuse and with the symptoms observed, delirium tremens was considered the most likely cause. A 5% alcohol drip was started.

There is no “treatment of choice” in delirium tremens. The use of intravenous alcohol, as with many other drugs that have been tried, is controversial if not condemned in the literature. The arguments against its use include its short duration of action, narrow safety margin between therapeutic and lethal doses, the tendency to cause gastric irritation, its possible enhancement of fatty metamorphosis of the liver and the fear of creation of an even greater emotional dependence on alcohol.

Several articles stated that intravenous alcohol will control only the minor early withdrawal symptoms and not the later, more severe ones. One study of 49 patients which compared different treatments for tremulous, agitated states and acute hallucinations of alcohol withdrawal found that of 12 patients treated with IV alcohol, withdrawal symptoms were not cured nor was delirium tremens prevented.

Intravenous alcohol was used in this case because our main objective was to decrease the overactivity of the sympathetic nervous system and to return the vital signs to near normal as rapidly as possible so the operation could be completed. A permanent cure of the delirium tremens was not intended.

Several authors stated that alcohol intravenously is either potentially or theoretically effective and Lee suggests that intravenous alcohol in 8 to 10% solutions, given over a few hours, may be useful in preventing alcohol withdrawal symptoms.

It has been calculated that an initial dose of five liters of 5% alcohol IV
would be necessary in the alcoholic who drinks one pint of alcohol a day. In this case we were able to abolish the symptoms and to achieve substantially beneficial results using relatively low doses of intravenous alcohol.

Two days following this anesthetic, the patient again returned to surgery for further debridement and skin grafts. He was given 5% alcohol IV as a prophylactic measure preoperatively. The anesthetic was uneventful. During his postoperative course he was managed with slowly decreasing amounts of alcohol IV and high doses of chlorpromazine.

Although an exhaustive search of available literature was not carried out, it was scanned back to 1973, and several texts and reference books on anesthesia were reviewed without finding mention of any other case reports or articles on delirium tremens occurring during anesthesia.

REFERENCES


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