

Case Reports

Multi-drugs Abuse Co-ingested with Fake Methanol Beverages in the Indonesian Adolescent: A Case Report

Dadang H Somasetia*, Marlene A Sutanto, Fina M Andriyani, Stanza U Peryoga and Dzulfikar DL Hakim

Department of Child Health, Universitas Padjadjaran, Bandung, Indonesia Department of Child Health, Universitas Padjadjaran, Bandung, Indonesia

Address Correspondence to: Dadang H Somasetia, Department of Child Health, Universitas Padjadjaran, Bandung, Indonesia, E-mail: vemma.hees@gmail.com

Received: May 26, 2021; **Accepted:** June 09, 2021; **Published:** June 16, 2021

Copyright © 2021 Dadang H Somasetia. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Abstract

The multi-drug abuse among adolescents with illicit drugs co-ingested with some fake methanol beverages at a recreational party becomes popular in Indonesia. Methanol poisoning might lead to severe illness or death. Methanol ingestion in Indonesia is often correlated with an outbreak and high morbidity and mortality. Tramadol, clonazepam, and chlorpromazine mixed with the cheesy fake methanol beverages induce profound altered consciousness and seizure.

We present the case of a 17 year old girl with repeated seizures, vomit, and decreased consciousness at home after taking of illicit drugs (tramadol, clonazepam, and chlorpromazine) co-ingested with a fake methanol beverage at a recreational party three hours before; lead to pediatric intensive care unit (PICU) admission and prolonged hospital stay.

This case highlights the acute management of patients who suffered from multi-drug abuse co-ingestion with a fake methanol beverage. Early detection and treatment are mandatory. The comprehensive rehabilitation program after recovery is a challenge.

Keywords: Adolescent; Co-ingestion; Fake alcoholic beverages; Methanol; Multidrug abuse

Introduction

Psychoactive substances (PAS) among adolescents are popular with significant morbidity and mortality [1]. Intoxication after consuming multi-drugs co-ingested with fake methanol beverages at a recreational party by teenagers tends to increase and leads to fatal case and outbreaks in Indonesia [2]. Co-ingestion of methanol with CNS-depressant drugs may cause a more severe altered consciousness and lead to the treatment in the emergency department (ED) and the PICU, with a prolonged hospital stay. Patients might be less anxious, less frequently agitated/aggressive,

and may show fewer hallucinations and psychosis if alcohol is co-ingested with PAS [3]. We report a teenage girl who drank fake methanol beverages co-ingested with illicit drugs at the recreational party three hours before and experienced seizures, vomit, and altered consciousness.

Case Description

A 17 year old girl has experienced seizures six times at home, lasting for 5-10 minutes together with altered consciousness and vomit. The patient was rushed to the emergency room of a private hospital. Three hours before seizure, the patient known took a lot of illicit drugs (tramadol, clonazepam, and chlorpromazine) along with illegal fake alcohol beverage at a recreational party in a nightclub where she employed. There were eight generalized tonic clonic seizure episodes without returning to a normal consciousness between episodes despite three doses of intravenous diazepam in 10 minutes intervals.

Therefore, the patient referred to ED of Hasan Sadikin general hospital as a tertiary referral hospital for status epilepticus, multidrug abuse, and non-COVID-19 on November 12, 2020.

We found the unconscious teenage girl with a Glasgow Coma Scale of 9, afebrile, low blood pressure 90/60 mmHg, heart rate of 88x/minute regular, respiratory rate of 30x/minute regular, oxygen saturation 98% on room air. Diameter of pupils 3 mm, equally reactive to light. The patient had a spontaneous and symmetric movement of both upper extremities, normal muscle tone, and increased physiology

deep tendon reflexes. No meningeal signs were found. Laboratory examinations were done, complete blood count and electrolytes were revealed normal. Later, benzodiazepine was detected in the urine drug test, and non-reactive for the HIV test. ECG showed a normal sinus rhythm. Electroencephalography revealed severe cortical hypofunction. Head Computed Tomography (CT) scan showed narrowing cortical sulci in fronto-temporo-parieto-occipital lobe and right Sylvian fissure, suspected cerebral edema (Figure 1).

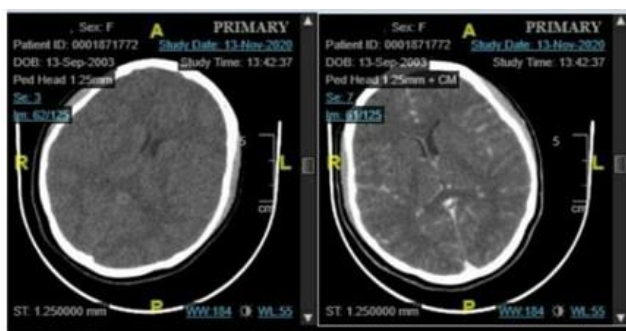


Figure 1: Head CT Scan of the patient showed narrowing cortical sulci in fronto-temporo-parieto-occipital lobe and right sylvian fissure, suspected cerebral edema.

The patient was managed as status epilepticus with the administration of phenobarbital 20 mg/kg loading dose twice, then continue to the maintenance dose of 5 mg/kg twice a day.

The patient was transferred and treated in PICU for 5 days. The short focal seizure episodes were still witnessed described by jerking movement of the mouth and right arm; blinking eyes lasting less than 1 minute, and looked confuse and experienced a visual and auditory hallucination. The intravenous carbamazepine 10 mg/kg/day was started. On psychiatric consultation was found a mental and behavior disorder, given haloperidol 0.5 mg once a day. After 14 days of hospitalization, the consciousness had recovered, and the patient comes home from the pediatric ward with medical approval. The patient planned to follow up in pediatric neurology and psychiatric outpatient clinic, and close follow up and rehabilitation at a governmental rehabilitation center.

Discussion

Alcohol is one of the substances with addictive potential most commonly used by adolescents [4]. Drinking in adolescence may turn to early initiation, frequent consumption, which leads to negative consequences for adolescent's psychological, social and physical health [4,5]. In the United States, ED doctors often face patients with alcohol or substance abuse [6]. In Indonesia, according to the National Anti-Narcotics Agency (Badan Narkotika Nasional), drug abuse is still one of the adolescent's problems. About 27.32% of drug users in Indonesia come from intermediate and high school and also university students, and this tends to increase [7].

Signs and symptoms of this patient consistent with status epilepticus caused by substance abuse; characterizes by

generalized seizures followed by partial seizures, the seizure activity consists of a tonic phase followed by clonic; alteration of blood pressure occur; subtle in last seizure, with partial rhythmic movements on the feet, hands, facial, or nystagmus; hyperthermia, tachypnea, and hypotension [2,8].

The substance abuse treatment includes diagnosis, mostly symptomatic treatment, and the other consequences of drugs used. After the acute ED treatment, an essential referral treatment, preventive, and rehabilitative approaches should be performed [1,6]. Failure to stop seizure early in this patient leads to a profoundly damaged brain with prolonged seizures and altered consciousness, as seen in this patient which late to switch from diazepam to phenobarbital. A fake cheesy methanol beverage co-ingested with tramadol, clonazepam, and chlorpromazine altogether will also aggravate the seizure course and conscious recovery.

Upon follow up in a pediatric neurology outpatient clinic, the patient noted improvement in general condition with fully alert. However, brief seizures were still present 2-3 episodes a day described by upward rolling of eyeballs, gazed to the right side, stiffed upper and lower right extremities lasting for less than 10 seconds. The patient was diagnosed with focal motor onset epilepsy, mental and behavior disorders, multi-drug abuse. Carbamazepine increased to 15 mg/kg/day. In the subsequent follow up in the psychiatry outpatient clinic, the patient still suffered from brief focal seizure episodes and severe visual and audible hallucination. Thus the haloperidol dose increased to 1.5 mg twice a day; the patient planned to follow the rehabilitation program in the drugs rehabilitation center.

The patient's habitual drinking of a fake methanol beverage along with tramadol, chlorpromazine, and clonazepam, and smoking has been done since two years ago following her schoolmates and neighbors. These cheesy fake methanol beverages and illicit drugs were taken from the black market. The patient was an 11th grade high school student before dropped out a year ago, because she experienced an inability to concentrate and low scores at school. The patient also had behavioral changes, prefer to be alone, irritable and easily upset, and often involved in aggressive assaultive behavior at school. Her father was unemployed, divorced, and the patient lived with her mother in a slum area where many teenagers smoking, and also consume a cheesy fake methanol beverages and illicit drugs. Because of financial problem, three months ago the patient started employed at the nightclub as a cashier.

Indonesia has a rapid and rising challenge with alcohol and drug abuse despite Muslim origins. Over 80 people died from ingestion of a mixture of alcohol and methanol in 2018, a rising number to 500 people between 2014 and 2018 [2]. According to a national survey, it was estimated that 1.5% of the Indonesian population aged 15-64 years have ever used illicit drugs. As many as 71% consumed cannabis and 15% methamphetamine. In 2005, the prevalence of opiate abuse was 0.2% among the adult population, cocaine abuse 0.03%, and amphetamine abuse 0.3% [9].

Alcohol intoxication also has several serious consequences: poor judgment, impaired coordination, ataxia, nausea, vomiting, euphoria, and speech slurring. Alcohol abuse in children manifests as problematic behavior in school, social impairment, inability to learn, and conduct disorder development [4]. These descriptions are consistent with the patient; her school performance was decreased with concentration impairment and change of behavior; thus the patient dropped out of her school.

Seizure is a common complication of drug intoxication, and drug poisoning causes up to 9% of status epilepticus cases. Drug induced seizures include antidepressants, stimulants, and antihistamines. Seizures generally occur due to inadequate inhibitory influences (e.g., gamma aminobutyric acid, GABA) or excessive excitatory stimulation (e.g. glutamate), although many other neurotransmitters play a role [10]. Acute voluntary poisonings often involve psychotropic drugs (anxiolytic hypnotic, antidepressant, antipsychotic) or ethanol, whose central toxic target is the central nervous system. Alteration of consciousness is most often due to a functional and reversible nature [1].

Methanol (toxic alcohol, methyl alcohol, C₂H₅OH) has a small molecular weight of 32 g/mol; and water soluble, it can easily penetrate the blood brain barrier. The half-life of oral methanol absorption takes only five minutes. The peak absorption occurs at 30-60 minutes, and the half-life elimination is between 12 to 20 hours. The lethal dose of methanol ranges from 15 to 500 mL [11]. In our patient, the seizure was appeared three hours after ingestion of one bottle of 100 mL methanol fake beverage; it can be estimated that the peak plasma level has been reached. The toxicity of methanol and its metabolism (formaldehyde and formic acid) occur through several mechanisms. Areas most affected by methanol toxicity include the putamen, basal ganglia, and the subcortical white matter of the brain and optic nerves [12].

There are no specific screening instruments or guidelines to detect the use or diagnosis of multi-drug abuse in adolescence. There are some validated questionnaires, as well as some biochemical analysis tests that evaluate the presence of multi-drug abuse. The care, relax, alone, family, friends, trouble (CRAFT), and the alcohol use disorder identification test (AUDIT) are the tools with the best performance. The CRAFT's advantage is that it also assesses the consumption of multiple drugs with moderate sensitivity and specificity. For alcohol issues, the AUDIT showed the highest sensitivity and specificity (95% and 77%, respectively), and it can be applied in approximately two minutes [1]. Unfortunately, at that time, we did not have such tools yet.

The acute alcohol intoxication symptoms are dose dependent, related to the serum level, and significant individual variability [1,13]. The most common symptoms are mood or behavior change, slurred speech, lack of coordination, unstable gait, nystagmus, and attention or memory deficit. In severe cases, mild sedation, stupor, or coma may be observed (as observed in this patient). Alcohol can cause

several metabolic effects, such as a high risk of hypoglycemia. Other metabolic effects are acidosis, hypokalemia, hypomagnesemia, hypoalbuminemia, hypocalcemia, and hypophosphatemia (such symptoms are not found in this patient). Cardiovascular effects may cause tachycardia, peripheral vasodilation, and volume depletion, leading to hypothermia and hypotension (as observed in this patient) [1].

It is important to estimate the blood alcohol content (BAC); the expired air has a good correlation with the alcohol levels. If it is not available, it can be estimated by the amount consumed and how long the last consumption was made (as done to this patient). The acute intoxication management in ED should be focused on the clinical complications, such as correction of hypoglycemia and agitation management. For severe agitation (such as our case), the antipsychotics with low alcohol interaction such as haloperidol should be administered [1].

Tramadol is considered to be a relatively safe opioid analgesic. Intoxications are usually occurred in co-ingestion with other drugs or alcohol. Symptoms of tramadol intoxication are similar to other opioids analgesics (as observed on the patient), such as central nervous system (CNS) depression, including coma, nausea and vomiting, tachycardia, cardiovascular collapse, seizures, and respiratory depression [14].

Clonazepam is a benzodiazepine derivative with the euphoric effect makes it a popular drug of abuse. Patients with benzodiazepine toxicity will primarily present with central nervous system depression ranging from mild drowsiness to a coma like, stupor state. The classic presentation of benzodiazepine overdose is CNS depression; respiratory depression less common compared to barbiturates, and can be seen after large oral ingestions with or without co-ingestants [15]. These manifestations are also seen in our patient; CNS depression, status epilepticus, nausea, and vomiting due to tramadol overdosed co-ingestion with clonazepam, chlorpromazine and fake methanol beverage.

Most drug induced seizures are self-limited. However, status epilepticus occurs in up to 10% of cases (as saw in the patient). Benzodiazepines are the first line anticonvulsant therapy for drug induced seizures. If benzodiazepines fail to stop seizures, second line drugs include barbiturates and propofol. Continuous infusion of one or more anticonvulsants may be required in refractory status epilepticus (phenobarbital was applied to this patient). There is no role for phenytoin in the treatment of drug induced seizures. Ketamine and levetiracetam is promising [10].

The management of multi-drug intoxication in PICU remains a challenge because each drug has a specific effect on metabolism. The vast majority of toxic exposures were treated with supportive treatment (as applied to this patient) [16]. Toxic substances can be rapidly removed from the circulation by hemodialysis, hemoperfusion, hemofiltration, and therapeutic plasma exchange (TPE). The TPE appears to be safe and effective in the treatment of pediatric severe multi-drug intoxication [17]. The guidelines from the American Society for Apheresis (ASFA) in 2019 stated

that TPE might be beneficial in cases of drug intoxication, especially in patients without clinical improvement despite supportive and antidotal treatments [18]. The TPE was not performed in this patient because of clinical improvement with supportive and standard treatments.

Conclusion

The cases of multi-substance abuse in adolescence in Indonesia tend to increase. The vast majority of multi-drug abuse intoxication were treated with supportive care. Only a few drug abuse intoxications required specific treatments include specific antidotes. The patient consumed multi-drugs (clonazepam, chlorpromazine, and tramadol) classified as drug induced seizures; co-ingested with a fake alcohol beverage will worsens the seizures, as proved by physical examinations, CT scan and EEG findings. Less aggressive anticonvulsant treatment will worsens the prognosis; like this patient suffered severe brain damage with the slow recovery of consciousness and seizures need PICU treatment.

A consultation with Addiction Center, pediatric neurology, and psychiatry are mandatory; and should plan a rehabilitation program. The family member and people around the patient play an essential role in the successful rehabilitation program.

Acknowledgments

The authors would like to express gratitude to the patient and his parents.

Consent

Informed consent was obtained from the patient and parents for publication of this case report

References

1. T.G. Pianca, A.O. Sordi, T.C. Hartmann, L. von Diemend. Identification and initial management of intoxication by alcohol and other drugs in the pediatric emergency room. *J Pediatr (Rio J)*, 93 (2017), 46-52.
2. Rehab in Indonesia – Addiction Center. Treatment Methods And Rehab In Indonesia
3. E.C. Heier, F. Eyer, S. Geith, C. Rabe, T. Zellner. Effect of ethanol co-ingestion in patients with central nervous system (CNS)-depressant intoxication. *Clinical Toxicology*, 58 (2020), 505–652.
4. J. Inchley, D. Currie, A. Vieno, T. Torsheim, C. Ferreira-Borges, et al. Editors. Adolescent alcohol-related behaviours: trends and inequalities in the WHO European Region, 2002–2014. World Health Organization 2018.
5. United Nations Office on Drugs and Crime (UNODC). World Drug Report 2020: Global drug use rising; while COVID-19 has far reaching impact on global drug markets. Press Release. Vienna, 25 June 2020.
6. R.S. Kraus, R. Worthington. Alcohol and Substance Abuse Evaluation. *Drugs And Diseases. Articles on Emergency Medicine*. Updated: Feb 12, 2016.
7. Badan Narkotika Nasional (National Narcotics Board). Drug Abuse Prevalence Survey 2019. Research, Data, and Information Center. National Narcotics Board. 2020.
8. K.C. McKenzie, C.D. Hahn, J.N. Friedman. Emergency management of the paediatric patient with convulsive status epilepticus. *Paediatr Child Health*, 26 (2021), 50-66.
9. Badan Narkotika Nasional & Pusat Penelitian Kesehatan Universitas Indonesia. Survei Nasional Penyalahgunaan dan Peredaran Gelap Narkoba pada Kelompok Rumah Tangga di Indonesia Tahun 2005 [National Survey on Abuse and Distribution of Illicit Drugs in Household Groups in Indonesia, 2005]. Depok, Puslitkes UI, 2005.
10. H.Y. Chen, T. E. Albertson, K. R. Olson. Treatment of drug-induced seizures. *Br J Pharmacol*, 81(2016), 412–419.
11. O. Kurtas, K. Y. Imre, E. Ozer, M. Can, I. Birincioğlu, C. Butun, et al. The evaluation of deaths due to methyl alcohol intoxication. *Biomedical Research*, 28 (2017),3680-3687.
12. D. Jammalamadaka, S. Raissi. Ethylene glycol, methanol and isopropyl alcohol intoxication. *Am J Med Sci*, 339 (2010), 276–281.
13. D.H. Somasetia, F.M. Andriyani, S.U. Peryoga and D.D.L. Hakim. Methanol-induced bilateral optic neuropathy in adolescent: A case report. *J Drug Alcohol Res*, 9 (2020), 1-3.
14. WHO. Expert committee on drug dependence. Tramadol update review report. Geneva. 2014.
15. M. Kang, M.A. Galuska, S. Ghassemzadeh. Benzodiazepine Toxicity. (2020). In StatPearls. StatPearls Publishing.
16. G. Ouellet, J. Bouchard, M. Ghannoum, B.S.Decker. Available extracorporeal treatments for poisoning: Overview and limitations. *Semin Dial*, 27 (2014), 342–349.
17. M. Özkale, I. Erol, Y. Özkale, I. Kozanoğlu. Overview of therapeutic plasma exchange in pediatric neurology: a single-center experience. *Acta neurologica Belgica*, 118 (2018), 451–458.
18. A. Padmanabhan, L. Connelly-Smith, N. Aqai, R.A. Balogun, R. Klingel, E. Meyer, et al. Guidelines on the Use of Therapeutic Apheresis in Clinical Practice - Evidence-Based Approach from the Writing Committee of the American Society for Apheresis: The Eighth Special Issue. *J Clin Apher*, 34 (2019), 171-354.