MEDICAL CHANNEL

Original Article / Case Report

METHANOL INTOXICATION: SPECTRUM OF DISEASE PATTERN IN THREE CASES AT TERTIARY CARE CENTRE IN KARACHI

** Abdul Rehman Qureshi, ** Alvia Saad*

* Department of Nephrology, Memon Medical Institute Hospital, Karachi. ** Registrar Medicine, Memon Medical Institute Hospital, Karachi.

Received on: 17-07-2017
Accepted on: 21-10-2017

ABSTRACT

Acute methanol intoxication is reported in both local and western world and is associated with significant morbidity and mortalilty. Methanol intoxication produces increased anion gap metabolic acidosis due to toxic accumulation of metabolites, primarily formic acid. The symptoms may vary from asymptomatic state, drunkenness to coma and siezures, therefore, an understanding of the mechanism of toxicity, treatment, and clinical course is essential in preventing serious systemic dysfunction. Prompt recognition and treatment are the keys to successful patient outcomes. This article presents three case reports of patients with methanol poisoning with different clinical course and outcomes. First patient presented with typical history of alcohol intake followed by symptoms and increased anion gap metabolic acidosis and increased osmolar gap. He was treated as per protocol of methanol poisoning case; however, he didn't survive. Second patient took alcohol (kachchisharab) and developed increased anion gap metabolic acidosis. He successfully recovered from this incident after providing treatment. Third patient who was chronic alcoholic presented with decreased vision typical after two days of ingestion of local brand of alcohol. Despite treatment he didn't survive. All the above mentioned cases presented after the last days of the holy month of Ramzan followed by Eid. They all consumed methanol or ethanol mixed with methanol, whichever was available, and presented with a diverse spectrum of symptoms and outcomes.

Key Words: Methanol intoxication, Haemodialysis, Ethanol, Bicarbonate infusion

Med. Channel 2017; 23(4) 72-74

Correspondence Author:
DR. ABDUL REHMANQURESHI
R-275, HaroonBunglows, Phase-1, scheme -33, sector -38/A University Road Karachi.
Contact no: 03452399012
Email:
rehmanqureshi20155@gmail.com

INTRODUCTION

Methanol poisonings have been reported in both Pakistani and foreignliterature [1, 2, 3]. As methanol is cheaper and easily available than ethanol, it is sometimes used as an alternative to ethanol in developing countries. Methanol intoxication is associated with significant mortality and morbidity [1]. Legal alcohol production is allowed in Pakistan, however

the sale of alcohol and consumption is restricted for minorities and foreigners. While wealthy Pakistanis buy foreign alcohol at significant prices, the poor often use cheaper quality that can contain methanol. Here three case reports of patients are presented with severe methanol poisoning with differentclinical course and outcomes.

CASE 1

A 40 year old man, an alcohol addict for last 10 years, presented in the Emergency Department (ER)of Memon Medical Institute Hospital (MMIH) Karachi on 2nd July, 2016 with ingestion of about 500mL of alcohol, 72 hours before presenting at the ER (as history given by patient's brother). He presented with diarrhea and vomiting for 3 days followed by drowsiness. The patient was found to have advanced renal failure with increased anion gap metabolic acidosis (38) and withanosmolar gap of 37. He was treated as a case of methanol intoxication on clinical grounds with dialysis (performed twice), bicarbonate infusion, and ethanol infusion. Methanol levels could not be measured as this facility is not available at MMIH. Despite treatment, he developed multiorgan failure and expired on 4th July 2016.

CASE 2

A 29 year old man, also an alcohol addict, took alcohol (kachchisharab) from a local shop near Safora Goth Karachi, and presented in the Emergency department (ER) of Memon Medical Institute Hospital Karachi on 4th July 2016 with a history of restlessness and shortness of breath for two days. He was found to be in severe metabolic acidosis with an anion gap of 51 and with an osmolar gap of 17. Bicarbonate infusion, and ethanol infusion (for 48 hours) were given. He was dialyzed (once). His metabolic acidosis improved and anion gap closed. The patient was discharged home after a hospital stay of four days. An ophthalmology examination was done at a later date and found to be unremarkable.

CASE 3

A 45 years old man, chronic alcoholic with last alcohol (local brand) intake about two days back presented in the Emergency Department (ER) of Memon Medical Institute Hospital Karachi on 6th July 2016 with history of shortness of breath, decreased vision and vomiting for two days. He was found to be in acute kidney injury with severe increased anion gap (38) metabolic acidosis. His serum osmolar gap was 15. He was treated with dialysis (twice), intravenous bicarbonate infusion, and ethanol infusion. The anion gap remained high, and later he also required inotropic support for tissue perfusion. Despite treatment,the patient expired on 8th July 2016.

DISCUSSION

Methanol is a color less and odor less alcohol that is found in various solvents, paint-dissolving liquids, cologne, denatured alcohol,varnish and antifreeze [4]. And it is toxic as well [1,2,3]. Methanol is metabolized by alcohol dehydrogenase and forms formaldehyde, which is later converted to formic acid [5]. In clinical scenario, methanol poisoning is associated with an acute drunkenness followed by without any symptom lasting for 24 to 36 hours and then pancreatic inflammation, fits, blindness, and coma may develop [5]. The blindness is caused by direct accumulation of formic acid in the retina. Methanol intoxication can also be associated with hemorrhagic manifestation in the putamen and white matter of brain, which can produce Parkinson disease–like syndromeof the delayed onset[5]. Patients may develop acute kidney injury and metabolic acidosis. The lethal dose of methanol is 60 to 250 ml [5].

The diagnosis of methanol poisoning can be made by history of suspected or documented toxic alcohol intake, clinical symptoms, features, and laboratory tests.An elevated anion gap with an osmolar gap is a significant clue to the diagnosis of methanol poisoning [5]. The treatment of methanol poisoning consists of gastric lavage, supportive management, and administration of antidote. Gastric lavage is done to patients presenting within the first hour after oral intake. In addition to supportive measures, the patient with methanol poisoning is treated with fomepizole (4-methylpyrazole), which inhibits alcohol dehydrogenase and prevents formation of toxic metabolites [6]. Asfomepizole is not practically available in Pakistan, intravenous ethanol is used to prevent the formation of toxic by-products and metabolites. Ethanol has a greater affinity for alcohol dehydrogenase than that of methanol and other alcohols. Hemodialysis is done to remove both the main compound and its metabolites. Metabolic acidosis correction is accomplished with an bicarbonate containing dialysate or by intravenous infusion of sodium bicarbonate [7].

All of three of the afore mentioned cases presented after the last days of the holy month of Ramzan followed by Eid. Access to pure or foreign ethanol was not easy for these patients during this time. They all consumed methanol or ethanol mixed with methanol, whichever was available, and presented with a diverse spectrum of symptoms and outcomes. Methanol poisoning can be fatal if not treated immediately and properly. Physicians should consider the possibilityof methanol poisoning if a patient who can not give a good history or in certain circumstances (like Eid, Deewali or any cultural event) presents with an altered conscious state and a high anion gap. Proper treatment measures should be started accordingly.

REFERENCES

1. Hovda KE, Hunderi OH, Tafjord AB, Dunlop O, Rudberg N, Jacobsen D. Methanol outbreak in Norway 2002-2004: epidemiology, clinical features and prognostic signs. J Intern Med.2005;258(2):181-90.
2. Shafi H et al. Eight fatalities due to drinking methanol-tainted alcohol in Pakistan: A case report, Egypt J Forensic Sci (2016).
3. Mirza FH, Arif K. Acute alcohol intoxication: prevalence, recognition and medicolegal importance. J Pak Med Assoc.1999; 49(9):220-1.
4. Burkhart KK, Kulig KW. The other alcohols. Methanol, ethylene glycol, and isopropanol. Emerg Med Clin North Am.1990;8(4):913-28.
5. Floege J, Johnson R &Feehally. Metabolic Acidosis.Comprehensive Clinical Nephrology. 5th ed. St Louis,Messouri: Elesevier Saunders; 2014:157.
6. Kraut J, Kurtz I. Toxic alcohol ingestions: Clinical features, diagnosis, and management. Clin J Am Soc Nephrol.2008;3:208-225.
7. Cheungpasitporn W, Jirajariyavej T, Kangwanpornsiri A. Role of sodium bicarbonate in the treatment of methanol-induced acidosis. Am J Med. Jun;125(6):e15.