



Methyl Alcohol (Methanol) Intoxication: A Case Report

Metil Alkol (Metanol) Zehirlenmesi: Bir Olgu

Birdal Yıldırım¹, Metin Pıçakçıefe², Ethem Acar¹, Ülkü Karagöz¹

¹Muğla Sıtkı Koçman University, Research and Training Hospital, Emergency Services, Muğla, Turkey

²Muğla Sıtkı Koçman University, Faculty of Medicine, Department of Public Health, Muğla, Turkey

Dear Editor,

Methanol (wood alcohol) is a solvent, volatile, colourless liquid. Metabolites of methanol are toxic. Most of the time they are orally taken in suicides or simply by accident. In methyl alcohol poisoning, the primary toxic factor is metabolic acidosis. It is known that formic acid, a primarily toxic metabolite, is directly proportional to the severity of metabolic acidosis and that signs of mortality and ocular signs correlate with the degree of metabolic acidosis. Lethal dose and morbidity limits are quite variable for human beings. Both in animal experiments and researches conducted on humans report histopathological findings related to bilateral putamen cystic or hemorrhagic erosion in methanol poisoning. As a result, methyl alcohol poisoning is a still common problem in Turkey to which no solution could yet be found (1). Chronic alcoholics, with an urge to drink anything with alcohol in it, may request drinking methanol containing drinks or they may purchase illegally produced alcoholic beverages that should not normally contain methanol and thus eventually get poisoned. Acute methanol poisoning can either be sporadic or epidemic and usually ends in death (2). Primarily methyl alcohol is not toxic. However, formaldehyde and formic acid, metabolites of methanol, are toxic (3,4). Just as in the case of ethyl alcohol, when taken orally, these are rapidly absorbed by the gastrointestinal tract (3,5). Although ethanol reach peak concentration levels within 30-60 minutes in the plasma, there is a quiet, symptom-free period ranging from 40 minutes to 72 hours (5). This is because of the slow metabolism of the formaldehyde into methanol (6). Typically, at the end of this period, there arise visual disturbances, headache, dizziness and confusion. In more severe poisonings, cerebral oedema, followed by coma and convulsions, can be observed (3). The lethal dose for methyl alcohol is between 100 to 250 ml. However, when swallowed, an amount as little as 60 ml can also be lethal (7). In our case, along with the causes of the sudden death of our patient such as the intensity in the emergency service, lack of ER care and in-depth stories about the patient, vague complaints and findings and not suspecting during the application, we have aimed to review the literature concerning methanol poisonings.

A sixty-two-year-old male patient, accompanied with his relatives, was admitted to the emergency room at around 15:00 with mild shortness of breath. The initial examination showed that he was conscious, oriented, and cooperative with 110/70 mmHg blood pressure, 88/min. pulse rate (rhythmic), 36.7 degree Celsius fever: 14/min. respiratory rate (rhythmic), and normal sinus rhythm (ECG). Further investigation concerning the patient's history of shortness of breath showed that he was diagnosed with chronic bronchitis at the Chest Diseases Clinic about a month ago or so and was invited to the clinic for a check the other day by a call from the secretary of the clinic. On physical examination, no pathological findings were found other than sibilant rhonchi in the patient's lungs and the long expiration duration. A treatment for chronic obstructive pulmonary disease was started. Blood samples were collected from the patient for routine blood chemistries, complete blood test, cardiac markers, D-dimer, and arterial blood gas. Apart from a mild elevation of CO₂, no abnormalities were found. PA chest X-ray was normal. In the light of the findings after physical examination, ECG findings, PA lung X-ray and blood gas values, acute coronary syndrome, aortic dissection and pulmonary embolism were initially eliminated and it was decided to evaluate further test results for which the patient was taken to observation room. Test results showed leukocytes as 15,6; glucose level as 194, and potassium as 5.9. Thirty minutes later, in the observation room, the patient started to suffer from shortness of breath and chest pain upon which ECG, blood gases, cardiac indicators, and D-dimer were re-performed. The patient was taken to the red area of the ER. Because of the deterioration in the general condition of the patient, his Glasgow Coma Scale being 6, blood gas results being pH: 6.917, pCO₂: 13.1, and HCO₃: 6.9, the patient was intubated. TA was 50/20mm-hg at the time and though further TA could not be taken. The patient underwent cardiopulmonary resuscitation (CPR). Starting from 1mEq/kg, the patient was given NaHCO₃. The patient's spontaneous breathing and cardiac circulation started again. In the meantime, more information was obtained from the patient's relatives. They reported that the patient was a chronic alcohol addict, has been regularly

drinking throughout the last week though did not consume any alcohol in the last twenty-four hours, was hospitalised last year due to cologne drinking, vomited on the way to the hospital that day, and that the patient suffered blurred vision problems. Assuming that the patient had methyl alcohol poisoning, we instantly planned hemodialysis for the patient. While inserting dialysis catheter through the femoral vein for hemodialysis, the patient re-arrested. Despite effective CPR, the patient was lost. Ethyl alcohol level in the patient's blood was 165 promille. Our hospital does not analyse methyl alcohol samples.

Methanol poisoning patients may be admitted to the emergency department with complaints of with central nervous system depression, visual disturbances, signs of gastrointestinal tract such as nausea, vomiting, and abdominal pain. In general, the patient stories relate cologne, spirit, or homemade alcohol taking. Coma may occur in patients with metabolic acidosis with increased anion gap, confusion, and in other severe cases. Visual disturbances may be seen in about 50% of patients. Visual impairment such as diplopia, blurred vision, decreased visual acuity, photophobia, visual field constriction, and even blindness may develop. Hypotension and bradycardia are among findings that grow in the following stages and thus they are signs of poor prognosis. Clinical signs are more associated with the severity of acidosis than the methanol concentration. If alcohol taking is accompanied with ethanol intake, the emergence of symptoms may be more extensible (8). Ethanol taking, the harmful effects of which are well-known, instead of methanol taking, is an important problem for severe alcoholics. Cases are mostly between the ages of 30-40 and 80-90% men constitute a large portion of this number (9).

In our case, the way our patient admitted to the emergency, the lack of gastro-intestinal tract, central nervous system and vision complaints, shortness of breath that prevented a possible successful prognosis, and the late developing confusion are noteworthy details. But in the case of Ünal et al. central nervous system findings such as confusion, was in the foreground (10), while Kavalcı et al. put gastrointestinal tract complaints and vision problems to the forefront (8), the literature similarly show patients applying to the ER with a culmination of complaints from these three basic systems.

As it was in our case, conditions like not having taken alcohol for the last twenty-four hours, losing consciousness within fifty-sixty minutes despite good

clinical findings in the patient's first emergency contact, and effects of methyl alcohol through metabolites like formic acid and formaldehyde make us consider more careful story taking in Emergency Rooms because of probable delays in acquiring these findings which result from prolonged conversions up to 72 hours. Methyl alcohol poisonings usually take place when ethyl alcohol is not available or due to suicides and accidents among men between the ages of 30-40 (1.9) though our case was a 62 year old male patient.

As a result, in the cases of alcohol-dependent patients who admit to emergency rooms for methyl alcohol poisoning, doctors should not only consider problems related to central system, gastro-intestinal system and vision, but also they should look for complaints like shortness of breath as it is a sign for differential diagnosis not just for men between 30-40, but also for male patients in their 60s. With this case report, we aimed to shed light and draw attention to the prolongation of clinical findings and mislead prognosis (up to 72 hours) due to delays in metabolite formation and to reasons of hiding alcohol addiction history for social reasons.

Best regards.

REFERENCES

1. Yayıcı N, İnanıcı MA. Metilalkol (Metanol) zehirlenmesi. Türkiye Klinikleri J Foren Med 2005;2:101-8.
2. Julia J. Liu, Mohamud R. Daya, N. Clay Mann. Methanol-related deaths in Ontario Clinical Toxicology 1999;37:69-73.
3. Barceloux GD, Bond GR, Krenzelok EP, Cooper H, Vale JA. American academy of clinical toxicology practice guidelines on the treatment of methanol poisoning. Clinical Toxicology 2002;40(4):415-46.
4. Yayıcı N, Ağritmiş H, Turla A, Koç S. Fatalities due to methyl alcohol intoxication in Turkey: an 8 year study. Forensic Science International 2003;131:36-41.
5. Riley RJ, Ilson BE, Narins RG. Acute metabolic acid-base disorder. Crit Care Clin 1987;5:699-724.
6. Kruse JR. Methanole poisoning. Intensive Care Med 1992;18:391-7.
7. Foris CS, Williams VL, Gutmann L. Methanol and the brain. Neurology 2000;54:1239.
8. Kavalcı C, Sezenler E, Kavalcı G, Çevik Y, Turan M. Metanol zehirlenmesi; olgu sunumu. Akademik Acil Tıp Olgu Sunumları Dergisi 2011;2:14-6.
9. Ekiz M, Yavuz Y, Duran L, Çelenk Y. Metil alkol intoksikasyonunda beyin manyetik rezonans görüntüleme bulguları: olgu sunumu. AKATOS 2011;2(4):20-2.
10. Ünal Ö, Tombul T, Arslan H, Şişman E, Erkoç R. Metil alkol intoksikasyonu: olgu sunumu. Van Tıp Dergisi 1999;6:31-2.

Received/Başvuru: 18.12.2013, Accepted/Kabul: 14.02.2014

Correspondence/İletişim

Birdal YILDIRIM
Muğla Sıtkı Koçman University, Research and Training
Hospital, Emergency Services, MUĞLA, TURKEY
E-mail: birdalgul@gmail.com

For citing/Atf için

Yıldırım B, Picakiefe M, Acar E, Karagoz U. Methyl alcohol (methanol) intoxication: a case. J Turgut Ozal Med Cent 2014;21:170-1-DOI: 10.7247/jtomc.2014.1599