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An Unusual Cause of Carbon Monoxide Poisoning: Narghile Smoking

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
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Conflict of interest: None declared

Patient: **Male, 27**
Final Diagnosis: **Carbon monoxide poisoning**
Symptoms: **Dizziness • nausea • Syncope**
Medication: **—**
Clinical Procedure: **O2 treatment**
Specialty: **Anesthesiology**

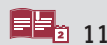
Objective: **Challenging differential diagnosis**
Background: Carbon monoxide (CO) poisoning is commonly seen during the winter season in Turkey due to use of charcoal stoves and water heaters, but narghile smoking is a rare cause of CO poisoning.
Case Report: In this paper, we report a CO poisoning case caused by narghile smoking. The patient was admitted to the ED with nausea, dizziness, vertigo, and syncope.
Conclusions: The diagnosis of CO poisoning depends on suspicious anamnesis. The major treatment of CO poisoning is oxygen supply.

MeSH Keywords: **Carbon Monoxide Poisoning • Signs and Symptoms • Syncope**

Full-text PDF: <http://www.amjcaserep.com/abstract/index/idArt/899590>



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Background

Narghile (water pipe, hookah, shisha) smoking is a conventional method of tobacco use in Middle East, Asia, and Africa. Narghile smoking is rapidly increasing worldwide among young people [1]. In Turkey, it is gaining popularity as a social activity [2]. Carbon monoxide (CO) exposure is higher in narghile smoking compared to cigarettes [3].

Narghile smoking is a rare cause of CO poisoning. There have been few cases of CO poisoning associated with the use of narghiles [2,4–7].

In this report, we describe a patient presenting to our Emergency Department (ED) with nausea, dizziness, vertigo, and syncope resulting from CO poisoning after narghile smoking.

Case Report

A 27-year-old man was brought by ambulance to our ED because of nausea, dizziness, vertigo and syncope. He was conscious when he arrived at the ED.

Physical examination results were normal, and he had no past medical history of note. There were no focal neurological signs or cranial nerve deficits.

His vital signs were within normal limits: blood pressure, 125/70 mmHg; pulse rate, 79 beats/min; temperature, 36.8°C; SpO₂, 97%; and Glasgow Coma Scale score, 15. His biochemical markers and electrocardiographies (ECG) were normal.

Further history exploration revealed that he had smoked a narghile in a house for 3–4 hours. We suspected CO poisoning and measured his arterial blood gas. His carboxyhemoglobin (COHb) level was 32.6%. He was immediately transferred to the Intensive Care Unit (ICU), and 100% normobaric oxygen by a non-rebreather mask was applied. The patient had normal biochemical examinations results, including complete blood count, electrolytes, and cardiac enzymes. At the 6th hour of treatment, his COHb level was decreased to 9.1%, and at discharge it was 1.0%. His ECG did not show any change. His echocardiography and CT scan of the brain revealed normal findings. At the 2nd day of admission, the patient was asymptomatic and was discharged home with complete recovery.

Discussion

Carbon monoxide (CO) is a colorless, odorless, and non-irritating gas that is produced by incomplete combustion of

hydrocarbons [8]. In Turkey, the main sources of CO poisoning are charcoal stoves and water heaters.

The smoke from a narghile contains toxic chemicals such as CO, polycyclic aromatic hydrocarbons, and volatile aldehydes. It can lead to many chronic diseases including cardiovascular disease, lung cancer, chronic obstructive pulmonary disease, and asthma. Moreover, it is associated with the spread of communicable diseases (such as herpes and tuberculosis) and CO poisoning [1]. Narghile smoking is an uncommon cause of CO poisoning.

Carbon monoxide is readily absorbed by the lungs, and competes with oxygen for binding to hemoglobin. The affinity of hemoglobin for CO is 200–250 times greater than its affinity for oxygen, so oxygen is displaced from hemoglobin, and carboxyhemoglobin forms. This results in inhibition of oxygen release, reduced oxygen delivery, and subsequent tissue hypoxia. CO binds to receptors of the cytochrome oxidase system, resulting in hypoxia at the cellular level. CO exposure has been shown to cause the production of free oxygen radicals and lipid peroxidation. Hypoxia may be followed by reoxygenation and reperfusion injury [9].

CO poisoning can present with a wide range of clinical symptoms. The most common symptoms of CO poisoning include headache, dizziness, nausea, vomiting, confusion, fatigue, chest pain, shortness of breath, and loss of consciousness [10,11]. The diagnosis of CO poisoning is difficult because of its non-specific symptoms; thus, COHb should be investigated in suspected patients. There is no direct relationship between COHb levels and clinical effects, but it is generally accepted that an initial level of greater than 15% suggests significant toxicity. Our patient was diagnosed with CO poisoning based on the information from his friends and on his increased COHb level.

The main purpose of treatment is to maintain hemodynamic stabilization and elimination of the CO [10]. The standard treatment for CO poisoning is administration of high-flow oxygen, either hyperbaric oxygen therapy or normobaric oxygen therapy. In our case, 100% oxygen treatment was applied by a non-rebreather mask.

Conclusions

This case demonstrates that a detailed anamnesis is the most crucial factor for the diagnosis of CO poisoning. In our case, CO poisoning was suspected from the patient's nonspecific symptoms and his narghile smoking anamnesis. The diagnosis was confirmed by his increased COHb level.

Conflicts of Interests

This report received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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