

Diagnosis and Management of Carbon Monoxide Poisoning in the Emergency Department.

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Abstract

An 89-year-old female is found by her family, lying unconscious on her kitchen floor after they had been unable to reach her by phone for several hours. EMS is activated and when the paramedics arrive, they note that the gas oven is on, and there is thin, gray smoke coming from around the door. The house gas supply is turned off, windows are opened, and the family and the patient are immediately evacuated from the home. En route to the hospital, the patient is placed on high-flow oxygen at 15 liters per minute by non-rebreather mask. Her bedside glucose determination is 229 mg/dL. Vital signs are within normal limits during transport. She opens her eyes to sternal rub, and makes spontaneous movements of all extremities. Upon arrival to the ED, the patient becomes more alert and is able to respond to your questions. She tells you that she remembers putting a tray of calzones into the oven, after which she has no recall of the day's events. She has a past medical history of "well-controlled" hypertension, hyperlipidemia, and non-insulin-dependent diabetes. Her medications include hydrochlorothiazide 25 mg daily, lisinopril 10 mg daily, simvastatin 20 mg daily, and metformin 1000 mg twice daily. On physical examination, weight is 65 kg, blood pressure is 97/50 mm Hg, heart rate is 113 beats per minute, respiratory rate is 22 breaths per minute, temperature is 37.1 degrees C (98.8 degrees F), and oxygen saturation is 99% on 15 liters per minute via non-rebreather mask. She appears her stated age. Cardiopulmonary examination is remarkable only for tachycardia. Her abdomen is soft and non-tender with normal bowel sounds. Her skin is warm and dry, and there is no peripheral edema. Her cranial nerves are intact, with briskly reactive, symmetric pupils. Motor and sensory examination is non-focal, and cerebellar testing is notable only for an intention tremor on finger-nose-finger test. Gait is normal and speech is fluent and without errors. Laboratory testing shows a hemoglobin of 10.3 g/dL and a leukocyte count of $11.7 \times 10^9/L$. Electrolyte results fall within the normal range, and her serum creatinine is 1.7 mg/dL. Qualitative CK-MB and troponin I tests are positive, and the sample has been sent to the STAT lab for quantitative testing. Serum carboxyhemoglobin level is 15% with normal serum pH on an arterial blood gas. An ECG reveals deep, down-sloping inferior and lateral ST-segment depressions which were not present on a routine cardiogram 1 month prior. You have many questions about this patient's care. What symptoms and physical signs need to be addressed and treated? What additional diagnostic testing should be performed? What treatment regimen is appropriate and what should be avoided? What are the risks or delayed complications from her illness? Are there special considerations for this or other patient populations?