

Methemoglobinemia Induced by the Nitrogenous Fertilizers

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Methemoglobinemia is a life-threatening condition which is rarely considered and difficult to recognize. Methaemoglobin (MetHb) cannot bind oxygen and produces a leftward shift in oxygen-dissociation curve, resulting in decreased oxygen delivery to the tissue. The increased concentration of MetHb in the blood may cause functional anemia, severe tissue hypoxia and even death. Acquired form of methemoglobinemia develops after exposure to some drugs and chemicals (local anesthetics, antimalarials, nitrites or nitrates, nitroprusside, sulfonamides, etc.), certain foods or food additives, significant smoke inhalation, or after serious illness such as gastrointestinal infections. The most common causes of acquired methemoglobinemia are local anesthetics, particularly benzocaine. In this case, methemoglobinemia developed after the sprinkling the chemical fertilizer that contained nitrogen, phosphorus, and potassium, and other nutrients. Symptoms vary from mild headache to coma or death, and may not correlate with measured MetHb concentrations. Patients with methemoglobinemia appear deeply cyanotic, but are unresponsive to standard oxygen therapy. It is essential for the clinician to recognize the problem rapidly in patients without hypoxia by analyzing their arterial blood gas. MetHb interferes with the accuracy of pulse oximetry. The antidote is methylene blue. We report a case of moderate methemoglobinemia after sprinkling the chemical fertilizer containing nitrogen. A 69-year-old male arrived in the emergency department (ED) with intense cyanosis. The patient said that he sprinkled the chemical fertilizers containing nitrogen without any gloves or without protective equipment. About 6 hours after exposed the chemical fertilizers, he developed lightheadedness, chest tightness, difficulty breathing, and nausea. At ED, arterial blood gas analysis showed pH of 7.378, PO₂ of 91.7 mmHg, bicarbonate of 22.1 mmol/L. however, the saturation on pulse oximetry was 89%. Hemoglobin was 14.7 g/dl and white blood cell count 11,140/mm³ with a normal differential count. Blood urea nitrogen, serum electrolytes and creatinine were within normal limits. The initial MetHb level was 49.1% of the total hemoglobin. He was not treated with methylene blue but with only hydrations. The MetHb levels gradually decreased (49.1% to 0.2% in fifteen hours), and the patients was discharged without symptom and sequelae.

Key Words: 질소비료, 메트헤모글로빈혈증, 중독

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