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A case of acute kidney injury caused by dapsons-induced methemoglobinemia in a patient with chronic kidney disease

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Case Study: An 80-year-old Korean woman visited our emergency department after ingesting approximately 1500 mg of dapsons in a suicide attempt. She had a history of hypertension and chronic kidney disease (CKD). On admission, she was cyanotic with a pulse oximetry saturation (SpO₂) of 83%, although she was not in respiratory distress. Heart rate was 101/min, respiratory rate was 14/min, and blood pressure was 80/50 mmHg. Her arterial blood gas analysis (ABGA) revealed pH 7.44, PaO₂ 194 mmHg, PaCO₂ 39 mmHg, bicarbonate 26 mmol/L, SaO₂ 99.7%, and methemoglobin of 28.4%.

Chest radiographs revealed no specific abnormalities. Her blood urea nitrogen and serum creatinine concentrations were 38 mg/dL and 1.6 mg/dL, respectively. Her hemoglobin concentration was 9.4 mg/dL.

After intravenous injection of methylene blue 1 mg/kg, the methemoglobin level decreased to 14.8 % with improved dyspnea. However, her respiratory status worsened on hospital day 3 with increased level of methemoglobin of 23%, which resulted in acute hypoxic respiratory failure and acute respiratory distress syndrome. Despite intubation and mechanical ventilation with PEEP of 12 mmHg and 100% FiO₂, hypoxia did not improve. ABGA showed elevated PaO₂ of 336 mmHg and SaO₂ of 100%, which were discordant with SpO₂ 80-90%. Thus, we administered ascorbic acid 1500 mg every 8 hours for 3 days and transfused 2 units of packed red blood cells on hospital day 3. Following those therapies, SpO₂ increased to 99% as the methemoglobin level gradually decreased. The patient was extubated on hospital day 10 with methemoglobin level of 14.9%.

However, her serum creatinine increased to 6.5 mg/dL on hospital day 14 with a stable urine output of 1.0-1.5 L/day. Fortunately, renal function improved without renal replacement therapy after hospital day 20 and had returned to 3.0 mg/dL at discharge. At the 6-month follow-up, her serum creatinine level was 1.7 mg/dL.