

## Acute Hemolysis Following an Overdose of Miracle Mineral Solution in a Patient With Normal Glucose-6-Phosphate Dehydrogenase Levels

Daniel Burke, MD; Bishoy Zakhary, MD; Evgeny Pinelis, MD  
NYU Langone Medical Center, New York, NY

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### Abstract

**SESSION TITLE:** Critical Care Cases II

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**INTRODUCTION:** Miracle Mineral Solution (MMS) is an alternative medicine that has been promoted to cure various diseases. It is an aqueous solution of 28% sodium chlorite that yields chlorine dioxide with the addition of citric acid. Prior case reports suggest MMS can cause hemolytic anemia in patients with glucose-6-phosphate dehydrogenase (G6PD) deficiency. We report a case of hemolytic anemia in a patient with normal levels of G6PD after the ingestion of a large quantity of MMS.

**CASE PRESENTATION:** A 75 year old man with prostate cancer presented with exertional dyspnea, malaise, and dark urine one day after the ingestion of 100 drops of MMS (recommended dose is 10 drops) purchased online for the treatment of prostate cancer. Pertinent labs included hemoglobin 5.1 g/dL, absolute reticulocyte count 170 K/uL, lactate dehydrogenase 1491 U/L, haptoglobin <10 mg/dL, a negative direct antiglobulin test panel, and a normal G6PD level of 10.3 U/g Hb. A peripheral smear was notable only for polychromasia. The patient was admitted and required 4 units of packed red blood cells during his hospital stay. The hemolytic anemia was self-limited and he was discharged after four days with a hemoglobin of 8.3 g/dL.

**DISCUSSION:** MMS is an aqueous solution of 28% sodium chlorite with a concentration similar to that of industrial strength bleach. The EPA has set a maximum level of chlorine dioxide to 0.8 mg/L in drinking water. A single drop of MMS contains 3-8 mg of chlorine dioxide. Chlorine dioxide is known to oxidize hemoglobin to methemoglobin and cause hemolytic anemia at high doses. Prior reports have demonstrated hemolytic anemia in accidental ingestions of sodium chlorite in a patient with G6PD deficiency (1), chlorine dioxide where G6PD levels were not tested (2), and where G6PD levels were low during hemolysis but normalized after recovery (3). To our knowledge, this is the second case of MMS-induced hemolytic anemia in a patient without G6PD deficiency and the first documenting normal G6PD levels during the acute hemolytic phase. This case stresses the importance of considering alternative medications in the differential of hemolytic anemia.

**CONCLUSIONS:** MMS is an alternative medication containing sodium chlorite, which has been shown to cause hemolytic anemia in patients with G6PD deficiency. This is the first case documenting hemolytic anemia in a patient with normal G6PD levels.

**Reference #1:** Romanovksy A, Djogovic D, et al. *J Med Toxicol.* 2013;9:67-70.

**Reference #2:** Kishan H. *J Med Toxicol.* 2009;5(3):177.

**Reference #3:** Lin JL, Lim PS. *Ren Fail.* 1993;15(5):645-8.

**DISCLOSURE:** The following authors have nothing to disclose: Daniel Burke, Bishoy Zakhary, Evgeny Pinelis

No Product/Research Disclosure Information