A Modified Sodium Metabisulfite Method to Distinguish Sickle Cell Disease from Sickle Cell Trait for Use in Underdeveloped Countries

TIM R. RANDOLPH, AUSTIN LE, JEFFERY DEMOND

ABSTRACT

The objective of this study was to develop a simple, inexpensive, and rapid confirmatory test using a sodium metabisulfite microscopic method to distinguish *AS* from *SS* genotype in patients with positive test results for hemoglobin S. Equal volumes of de-identified EDTA blood and 2% sodium metabisulfite were mixed, placed on a microscope slide with coverslip, and observed for sickling at 30-minute intervals over 3 hours. Sickle cells were enumerated per 200 red blood cells (RBCs) under 100x oil immersion and placed into 4 Likert categories (1+ to 4+) based on degree of sickling. In *AS* samples, 2+ and 3+ sickle cells rose most rapidly, and 4+ sickle cells showed the steepest rise in the *SS* samples. Based on these data, the number of 4+ sickle cells were counted every 30-minutes over 3 hours in 5 *AS* and 28 *SS* samples at 37°C. The mean numbers of 4+ sickle cells in *AS* samples were 4.75 per 200 RBCs at 2 hours and 17.75 per 200 RBCs at 3 hours. *SS* samples yielded 78.29 per 200 RBCs at 2 hours and 115.43 per 200 RBCs at 3 hours. Two-hour incubation showed a statistical difference ($P = 0.00024$) among groups in the shortest time and may be used to distinguish *SS* from *AS* genotypes. More testing is needed to determine cut points to distinguish genotype.

ABBREVIATIONS: RBC - red blood cell.

Clin Lab Sci 2019;32(3):93

Tim R. Randolph, *Saint Louis University*

Austin Le, *Saint Louis University*

Jeffery DeMond, *Saint Louis University*

Address for Correspondence: Tim R. Randolph, *Saint Louis University, tim.randolph@health.slu.edu*

Downloaded from http://hwmaint.clsjournal.ascls.org/ on August 24 2024