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# Development of Rama urine and plasma color charts for semi-quantitative Paraquat test

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**Objective:** The sodium dithionite test is a semi-quantitative paraquat measurement and is reported as one of the prognostic predictors. Here, we developed Rama urine and plasma color charts for semi-quantitative paraquat measurement and analyzed its accuracy.

**Methods:** We developed Rama plasma and urine color charts for the sodium dithionite test. We tested the different types and different amounts of the chemical alkali in the experiments to find out the optimal type and amount of the substance for the urine and plasma sodium dithionite test. We used various paraquat concentrations (0.5-2,000 mcg/ml in urine and 0.3-1,000 mcg/ml in plasma) for analysis by the sodium dithionite tests. After finishing the tests, we collected the pictures of each test with different concentrations of paraquat. We took these photos by the full frame digital camera with color calibration for the cameras, computer monitors and printers. Then, we developed the color charts as the paper charts. We retested the experiments in triplicate to ensure that we had obtained the accurate colors. We measured paraquat concentrations in the plasma and urine by High Performance Liquid Chromatography and spectrophotometry methods. The method validation including statistical analysis was performed as the standard laboratory methods.

**Results:** The Rama plasma and urine color charts including the methods of plasma and urine sodium dithionite test were created and developed. The steps of the development procedures were clarified. The color charts for both urine and plasma displayed the different colors of the blue bands shading by the different concentrations. These color charts showed high precision (> 90%) and high accuracy (sensitivity and specificity > 90%) when compared to the HPLC method. The limits of detection of these urine and plasma color charts were 1 and 0.5 mcg/ml, respectively.

**Conclusion:** Rama urine and plasma color charts could estimate the amount of the paraquat in the patient's urine and plasma. The color charts were used to standardize the color of the sodium dithionite test and might be applied to predict the prognosis of paraquat poisoned patients.