

Title: Establishment of Screening Methods for G6PD Deficiency – Translational and Clinical Applications.

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Goal: To develop feasible screening methods for activity of the enzyme Glucose-6-phosphate dehydrogenase (G6PD) with point-of-care applicability.

Background: Current knowledge establishes the relevance of G6PD as a critical therapeutic determinant for effective antimalarial therapy – and thus the program for elimination of malaria - due to the occurrence of mutations that lead to post-treatment severe adverse effects. Therefore, there is a crucial need for effective screening methods for selection of subjects who will benefit of antimalarial agents. We present our findings on development of cost effective point-of-care screening methodologies to ascertain G6PD deficiency.

Methods and Results: Using Patient Cohort Explorer and data from the Department of Pathology, we established the prevalence of G6PD deficiency at the University of Mississippi Medical Center, Jackson, MS as high as 11.8% (African-American males in all population, n=2518). Next, for selection of potential target groups, we set up a protocol for recruitment of volunteers based on ethnic background, parental ethnicity, and medical history. G6PD activity was evaluated using point of care methods [Trinity Biotech test or CareSTART Biosensor], and Gold Standard quantitative spectrophotometric assay (LabCorp). Determinations in >20 subjects have showed comparable concordance. If used with a conservative interpretation of the signal, the Trinity Biotech test showed superior potential for use in the field relative to the CareSTART Biosensor.

Significance of Impact: We established the prevalence of G6PD deficiency in our medical center. We have also setup tests for point-of-care assessment of G6PD. Pending evaluation of the relative tests performance, we will be in position to screen individuals and select them for a prospective clinical trial to evaluate the safety of antimalarial agents on scope of G6PD deficiency.

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