Evaluation of the CareStart™ Glucose-6-phosphate dehydrogenase (G6PD) Rapid Diagnostic test at Community and Health Centers in Cambodia

Bertha WojnarSKI1,2, Chanthap Lon1, Darapiseh Sea1, Somethy Sok1, Sabaitphi Srivichai1, Soklyda Chann1, Sohei Hom1, Sokna Ly4, Pheaktra Oung1, Nareth Kong1, Vannak Pheap3, Chanthap Lon1, Darapiseth Sea1, Somethy Sok3, Sabaithip Sriwichai1, Soklyda Chann4, Sohei Hom4, Sokna Ly4, Chandara Sok4, Samon Nou4, Pheaktra Oung4, Nareth Kong5, Vannak Pheap5, 1.US Armed Forces Research Institute of Medical Sciences, Bangkok, Thailand, 2. The George Washington University, School of Nursing, Washington, DC, 3. Ministry of National Defense, Department of Health, Phnom Penh, Cambodia, 4. US Armed Forces Research Institute of Medical Sciences, Phnom Penh, Cambodia, 5. National Center for Parasitology, Entomology and Malaria Control, Phnom Penh, Cambodia, 6. PMI, Malaria Branch, Division of Parasitic Diseases and Malaria, CDC

Background

Primenuine (PO) is the only FDA-approved drug for radical cure of Plasmodium vivax (Pv) malaria but treatment can result in life-threatening hemolysis if given to a glucose-6-phosphate dehydrogenase deficient (G6PD) patient. Therefore, the G6PD status of the patient with Pv must be known prior to prescribing PQ. To increase PQ access in Cambodia, performance of G6PD rapid diagnostic tests (RDTs) needs to be evaluated in healthcare workers (HCWs) and village malaria workers (VMWs).

Methods

Design

• Quasi-experimental design in Oddar Meanchey province, Cambodia.
• Post-training, each of the 94 HCW/VMWs (age 18-69yrs) performed on average 10 G6PD RDT tests on 960 adult males.
• Performance of CareStart™ RDT for G6PD screening was assessed against quantitative G6PD test (Pointe Scientific, Inc. Canton MI).
• Pre/post-training questionnaires completed by HCW/VMWs and G6PD volunteers.

Blood sample collection

• Study was conducted from Dec, 2017 to Feb, 2018.
• Finger prick blood sample was obtained for CareStart™ RDT testing in the field.

Data Collection

• Demographics data was collected with questionnaires.
• Perceptions on PQ risk and benefits and willingness to use G6PD RDTs for screening was evaluated

Primary Endpoint

Assess the sensitivity, specificity, PPV and NPV of CareStart™ RDT in the field setting vs. the quantitative G6PD activity thresholds (“gold standard” for G6PD diagnosis).

Analysis:

• Descriptive and inferential statistics to evaluate the acceptability and effectiveness of training.
• Static and Graph from 7. Standard methods for calculating sensitivity, specificity, PPV & NPV were applied to the G6PD RDT (95% CI).

Results

CareStart™ G6PD Rapid Diagnostic Test offered at the Point-of-care will alleviate the lack of testing for G6PDd thereby lowering the risk of hemolysis when PQ is prescribed.

With minimal training, CareStart™ RDT is highly specific, feasible and a practical option for the identification of G6PDd male patients and its use may enable safer prescribing of PQ to decrease the burden from Pv relapse.

Conclusion

Community engagement can have profound effect on PO risk perceptions and integrating short training within community settings should be a priority with the planned deployment of PQ.

Most trainees were very receptive to the information provided about PQ and RDT testing, and were able to retain knowledge acquired during training.

Though the numbers were small, some G6PD volunteers will be misclassified as normal and therefore, patient follow up, monitoring and patient counseling will be paramount to successful deployment of PQ in Cambodia.

Acknowledgments

• National malaria program (CNM) for their technical assistance in carrying out this project in Cambodia.
• Training tools and G6PD counseling script were very effective.

Disclaimer: Material has been reviewed by the Walter Reed Army Institute of Research. There is no objection to its presentation and/or publication. The opinions or assertions contained herein are the private views of the authors, and are not to be construed as the official views of the Department of the Army or the Department of Defense. The investigators have adhered to the policies for protection of human subjects as prescribed in AR 70–25.