



Knowledge and Adherence to the National Guidelines for Malaria Case Management in Pregnancy among Healthcare Providers and Drug Outlet Dispensers in Rural, Western Kenya



EDCTP

BILL & MELINDA
GATES *foundation*

Christina Riley^{1*}, Stephanie Dellicour², Peter Ouma³, Urbanus Kioko⁴, Feiko O. ter Kuile², Ahmeddin Omar⁴, Simon Kariuki³, Ann M. Buff^{5,6}, Meghna Desai^{5,7}, Julie Gutman^{5*}

1 Rollins School of Public Health, Emory University, Atlanta, United States of America, **2** Liverpool School of Tropical Medicine, Liverpool, United Kingdom, **3** KEMRI, Centre for Global Health Research, Kisumu, Kenya, **4** Malaria Control Unit, Ministry of Health, Nairobi, Kenya, **5** Malaria Branch, Division of Parasitic Diseases and Malaria, Center for Global Health, US Centers for Disease Control and Prevention, Atlanta, United States of America, **6** US President's Malaria Initiative, Nairobi, Kenya, **7** Centers for Disease Control and Prevention, Kisumu, Kenya

PLOS ONE | DOI:10.1371/journal.pone.0145616 January 20, 2016

Introduction

- In line with World Health Organization (WHO) recommendations, the Kenya Ministry of Health (MoH) recommends that pregnant women;
 - Use long-lasting insecticidal nets (LLINs)
 - Receive intermittent preventive treatment in pregnancy (IPTp) with sulphadoxine-pyrimethamine (SP)
 - Receive prompt and effective malaria diagnosis and treatment with a safe drug

Correct Case Management of Malaria in Pregnancy

- Appropriate malaria diagnosis
 - Rapid diagnostic test (RDT)
 - Blood slide microscopy
- Adequate pregnancy assessment
 - Last Menstrual Period/gestational inquiry
 - Pregnancy test
- Appropriate Treatment
 - Correct drug prescribed for pregnancy status
 - Correct drug dosage and regimen instructions

Treatment Guidelines

- Artemether-lumefantrine as 1st-line treatment
 - Non-pregnant women
 - women in 2nd/3rd trimester
- Quinine as 1st-line treatment
 - Women in 1st trimester
 - 3 tablets, 2 times a day, for a full 7-days
 - AL or DP may be used in the event of treatment failure or quinine stock-out
- Sulphadoxine-pyrimethamine
 - Solely for intermittent preventive therapy in pregnancy (IPTp) in 2nd trimester or later
 - Never to be used as treatment for acute malaria

Data on MiP Management

- Limited data exists on healthcare provider adherence to case management guidelines for MiP
- A systematic review and meta-analysis of global MiP case management in 2014 reported that healthcare providers followed pregnancy specific treatment guidelines in 28% of first trimester versus 72% in other trimesters
- In Uganda, 70% of women received a contraindicated antimalarial during first trimester pregnancy and less than 6% received quinine
- In Tanzania, 43% of drug dispensers in registered pharmacies offered AL regardless of gestational age and only 20% knew that AL was contraindicated during first trimester

Adherence Study in Western Kenya

- We conducted a cross-sectional study in 51 health facilities (HF) and a randomly-selected sample of 39 drug outlets (DO) in the KEMRI/CDC Health and Demographic Surveillance System (HDSS) area in western Kenya
- Study Period
September to November 2013
- Study Areas
Siaya County HDSS area
 - Bondo - 6 Health Facilities
 - Gem - 19 Health Facilities, 13 Drug Outlets
 - Rarieda - 9 Health Facilities, 10 Drug Outlets
 - Siaya - 16 Health Facilities, 18 Drug Outlets

Key Findings

- **Malaria Diagnostics:**

- 77% of women diagnostically tested (via RDT or microscopy) in health facilities
- 9% of simulated clients in drug outlets offered an RDT or asked about previous testing

- **Pregnancy Assessment:**

- 43% of not visibly pregnant women assessed for pregnancy in health facilities
- 7% of the female simulated clients in drug outlets assessed without being prompted

Key Findings

Treatment & Dosage

Prescription of the correct drug for pregnancy trimester at the correct dosage was observed in 66% of all cases in health facilities and 40% in drug outlets

- 1st trimester prescription
 - Correct practice: 32% in health facilities and 0% in drug outlets
 - Correct knowledge: 56% of HF providers and 0% of DO dispensers
- 2nd/3rd trimester prescription
 - Correct practice: 65% in health facilities and 38% in drug outlets
 - Correct knowledge: 87% of HF providers and 39% of DO dispensers

Key Research Findings

Treatment & Dosage

- Exposure to AL in 1st trimester
 - 16% of cases in health facilities
 - 51% of cases in drug outlets
 - none were a result of quinine stock-out.
- SP prescribed for treatment of acute malaria
 - 3% of cases in health facilities
 - 18% of simulations in drug outlets
- Inadequate quinine dosage
 - > 70% health facility patients
 - quinine was never prescribed in drug outlets

Implications

- Failure to assess for possible pregnancy
 - Potential inadvertent exposure to AL in early pregnancy
- AL prescription in 1st trimester
 - Potential harm to the fetus
- Prescription of SP as treatment or inadequate dosage of quinine
 - Treatment failure and malaria relapse
 - Adverse consequences to the mother and fetus
 - Emerging drug resistance

Conclusions

- Overall, our study highlighted significant knowledge inadequacies and incorrect prescribing practices in the treatment of MIP
- Particularly concerning is the prescription of contraindicated medications in the first trimester
- These inadequacies should be addressed through comprehensive trainings and increased supportive supervision

Acknowledgements

- KEMRI
- CDC
- US President's Malaria Initiative
- Emory University, Rollins School of Public Health
- National Malaria Control Programme
- Study Participants from Asembo, Gem and Karemo