Symptomatic *Plasmodium vivax* infection with parasite density higher than commonly observed in Duffy-blood-group negative patient in Mali, West Africa

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Abstract

*Plasmodium vivax* (*P. vivax*) was observed not to be able to infect the red blood cells of Duffy-blood-group negative people particularly in Central and West Africa. In the last decade, *P. vivax* has appeared across sub-Saharan Africa as well in areas inhabited predominantly by Duffy-blood-group negative populations. Previous studies suggested that *P. vivax* is less efficient in Duffy-blood-group negative people and infection is milder than the one observed in Duffy-positive individual. Also, parasite density in Duffy-blood-group negative individual was reported to be very low. Our recent data have shown that chronic carriage of asymptomatic *P. vivax* infection in Duffy-blood-group negative individual can be associated with anemia. Moreover, cross sectional surveys are ongoing to better understand the paradigm shift of *P. vivax* infection in Duffy-blood-group negative individuals. Preliminary data show high *P. vivax* parasite density in febrile Duffy-blood-group negative child.

Objectives and Hypothesis

Aim 1: To determine molecular prevalence of *P. vivax* infection in sample collected from febrile patient

Aim 2: To determine the Duffy-blood-group status of patients carrying *P. vivax* infection

Hypothesis: In malaria endemic areas predominantly inhabited by Duffy-negative populations, *P. vivax* malaria occurs in Duffy-blood-group negative patient and parasite density might be high.

Methods

- **Study site**
  - Samples were collected from 8 different sites,
  - Seasonal malaria transmission

- **Study population**
  - Children cohort and all age patients
  - Blood samples collection and malaria microscopy

- **DNA template extraction and amplification**
  - DNA was extracted from filter paper dried blood spot using FavorPrep™ 96-Well Genomic DNA Extraction Kit (Favorgen Biotech Corporation)
  - Multiplex *Plasmodium falciparum* (Pf) and *Plasmodium vivax* (Pv) protocol using TaqMan Master Mix

- **Human DARC genotyping**
  - Styl and Bani RFLP

- **Current and Future Activities**
  - Cross sectional surveys of *Plasmodium vivax* infection with a larger sample size in different age groups and different geographical regions in Mali, West Africa
  - Carry out *in vitro* cellular assays to determine receptors/ligand involved in the invasion of Duffy-negative erythrocytes
  - Seroprevalence of *P. vivax* infection to help characterize parasite transmission dynamics and identifying areas for more interventions

Acknowledgments

- **Study populations**
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