

Evaluation of saliva-derived *Plasmodium falciparum* DNA using the OMNigene®•ORAL kit in detection of malaria

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Overview

In malaria holoendemic areas such as western Kenya, *Plasmodium falciparum* malaria is detected through microscopic examination of blood films from a suspected patient. The use of an invasive procedure to obtain blood as the primary source suffers from many challenges, which include: the pain associated with a needle that has turned away many would-be volunteers in clinical studies and the risk of inoculating the study participants with pathogenic microbes if proper sterilization is not performed at the point of injection. Therefore, an immediate need to develop a non-invasive, specific and sensitive method of detecting malaria and other diseases in routine health care services is desirable. DNA has been an important source of specimen in genetic variants and disease association studies.

Methodology

A cross-sectional study was conducted to evaluate the quality of saliva-derived DNA relative to traditional blood derived DNA of the same individuals with clinical symptoms of malaria (aged ≥ 4 years; n= 100) and resident in *Plasmodium falciparum* holoendemic transmission region of western Kenya. Participants provided matched blood and saliva samples for microbial DNA using DNA Genotek's OMNigene®•ORAL self-collection kit. The extracted DNA was subsequently used to genotype parasite Merozoite Surface Protein (MSP)-2. The MSP-2 parasite genotyping was carried out through nested PCR.

Background

- Globally, falciparum malaria accounts for the greatest degree of malaria-related morbidity and mortality (WHO, 2000).¹
- Traditional methods have always employed the use of Giemsa-stained thin or thick blood films in microscopy studies for detection of malaria parasitemia (Lieke *et al.*, 2004; Wongsrichanalai *et al.*, 2007).^{2, 3}
- Rapid diagnostic tests (RDT) or “dipstick”, an antigen-based detection method, is used to detect protein markers of *Plasmodium* species in the blood of asymptomatic individuals. This approach still requires blood and therefore remains invasive.
- Taken together, these factors may reduce the rapid response rate in management of malaria, in the process posing a significant problem to malaria surveillance and control. Thus, an alternative source for malaria diagnosis that incorporates molecular tools is a necessity.

Purpose

To evaluate the quality of saliva-derived DNA relative to traditional blood derived DNA of the same individuals with clinical symptoms of malaria in western Kenya.

Study site and methodology

Study design: The study was carried out in a rural setting in western Kenya.

Individuals aged 4 years and above (n= 100) of both genders and presenting with clinical symptoms of malaria were recruited following written informed consent from the parents/guardians of the study participants.

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