Evaluation of transmission blocking capability of anti-malarial drugs after multi-stage inhibition of *Plasmodium* gametocyte through standard membrane feeding assays (SMFA).

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Introduction

- Malaria elimination needs drugs targeting sexual stages of *Plasmodium falciparum* need to be incorporated in treatment regimen along with schizonticidal drugs to interrupt transmission.
- Antimalarial drugs have been reported to affect gametocyte production in vivo, which leads to a potential increase in transmission of disease burden.
- Multi-stage inhibition of Plasmodium gametocyte through standard membrane feeding assays (SMFA) is tough call to evaluation of the anti malarial drugs effect.

Objectives

- To evaluate the transmission blocking capability of antimalarial drugs.
- Satge specific effect of current antimalarial drugs on Plasmodium parasite.

Methodology

- In- vitro gametocyte Production
- Plate coating according to WHO protocol and multistage incubation of parasite for up to 24 to 48 h.
- The susceptibility of the parasites to chloroquine, quinine, atovaquone, artemisinin, DHA, artesunate, mefloquine, primaquine, lumefantrine and artemether was determined using tritiated hypoxanthine incorporation. The assays were performed in triplicate on at least 2 separate occasions
- Stage specific gametocytocidal activity was evaluated by microscopic examination
- SMFA acquired in A. stephesi of 25 mosquito in two separate bowl; control and infected. Membrane feeding were allowed for up to 15 min. Following the feed mosquito were sacrificed between 4-7 days with 70% ethanol and dissected to enumerate oocysts in their midguts.

RESULTS

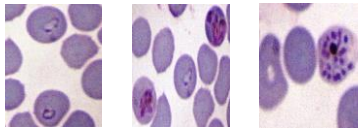

Figure 1: Asexual Stages of parasite

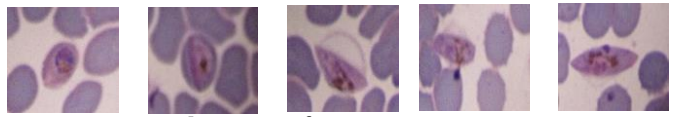

Figure 2: Sexual Stages of parasite

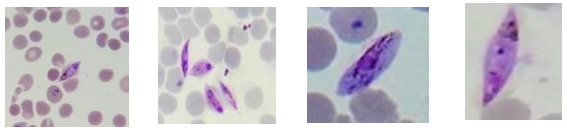

Figure 3:Normal Morphology of parasite before incubation

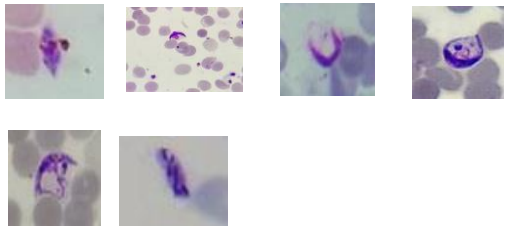

Figure 4: Morphology deformation of parasite after incubation

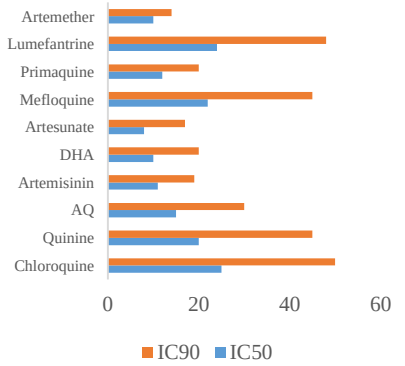

Figure 5: Inhibitory concentration of antimalarial drug against the parasite

Figure 6: Membrane feeding incubation in environmental chamber

OUTCOMES OF THE STUDY:

+ Our results indicate that late-stage gametocytes are refractory to all of the classes of antimalarial agents.
+ The long-acting quinoline antimalarial drugs, are having an effect on gametocyte formation
+ Primaquine was effective in both early and late stage gametocytes through SMFA.
+ The ex-vivo study for all the antimalarial agent will be explored through SMFA.

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