Do insecticides have the same effectiveness against infectious and non-infected mosquitoes?

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Background: Insecticide resistance in vector mosquitoes represents a threat on the effectivness of vector control strategies. However, Long Lasting Impregnated Nets (LLINs) remains the main tool to reduce the overall malaria burden. We made the hypothesis that LLINs may remain efficient on malaria transmission in spite of insecticide resistance by affecting the infected mosquitoes more specifically. Indeed, several studies have shown that *Plasmodium* parasites can manipulate mosquito behavior and we suspect that it may modify mosquito response when facing impregnated material during host seeking. The purpose of this study was to explore whether *Plasmodium* infection affects *An. gambiae* feeding behavior on vertebrates hosts protected by LLINs.

Method: *Plasmodium falciparum* gametocyte carriers were selected by examining thick blood smears from children aged between five and eleven in Bouaké, Côte d'Ivoire. Eligible children were driven to the laboratory after health examination and venous blood was collected. One part of substituted-serum blood was used as infectious blood while the second part was heat-treated to inactivate gametocytes (non-infectious blood). Three to five day-old female mosquitoes were allowed to feed infectious and non-infectious blood for up to 30 minutes through a Parafilm membrane. Mosquitoes exposed to parasite infection *versus* non-exposed, were then released into flight tunnels 6 days or 13 days after the blood meal, and their ability to pass through holed net impregnated and feed on guinea pig was measured.

Result: *Plasmodium falciparum* infection had no significant effect neither on mortality rate nor blood feeding success both at 6 and 13 days after blood meal. Nevertheless, insecticide induced high mortality at 13 days after blood meal (44.43%) compared to 6 days (18.88%)(P=0.001). Blood feeding rate recorded with insecticide was significantly low at 13 days (27,12%) post infection compared to 6 days (35%) post infection (P=0.002).

Conclusion: Our results did not reveal an effect of infection in mosquitoes on its ability to pass an impregnated net and bite a host. We confirmed that mosquito age can affects mosquito feeding and susceptibility to insecticides as mortality to deltamethrin was higher in older mosquito.

Key word: *An. gambiae*, resistance, *Plasmodium,* infection, Cote d'Ivoire.