Prevalence of Plasmodium falciparum transmission immunity in two different endemic areas in Senegal

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Introduction
Malaria continues to cause alarming morbidity and mortality in more than 100 countries worldwide. Immunity against the transmission stages of the malaria parasite represents an important approach to reduce malaria transmission and is believed to become an important tool for gradual elimination of malaria.

Research questions:
Is there a difference between mosquito infectivity and immune response in naturally exposed individuals in areas with malaria transmission intensity different?

Method:
Antibody prevalence was assessed using luminescence assay and patients and mosquito infection were done using standard membrane feeding assay

Results

Cross sectional study

Transmission season

(Low) (High)

Figure 1: Study design

Figure 2: Study sites

Figure 3: Seropositivity of anti-pfs230C1 & pfs48/45 antibody by age group

Figure 4: Prevalence of antibody against some asexual asexual antigens

Figure 5: Comparison of probability positive value between antibody against sexual & asexual stage antigens

Table 1: Infectivity of patients & mosquitoes by SMFA

<table>
<thead>
<tr>
<th>Saraya</th>
<th>keur Soce</th>
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<tbody>
<tr>
<td>infected patients</td>
<td>7/13 (53.8%)</td>
</tr>
<tr>
<td>infected mosquito</td>
<td>5/198 (4.5%)</td>
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Discussion
Antibody profiles for sexual and asexual antigens are higher in Saraya where P. falciparum parasite prevalence is high. Antibody level against MSP1 no longer increases after 25 years, while the prevalence level of anti-pfs230 antibody increased with age.

Infectivity to Anopheles gambiae was tested on 32 P. falciparum positives samples in both sites. In Keur Soce, 1 in 5 samples was infective and in 102 mosquitoes, 5 were oocyst infective. While in Saraya 7 in 13 positive samples were mosquito infective and 7 mosquitoes were oocyst infective 7 days after experimental feeding.

Comments:
These results suggest a regulation in anti-sexual stage parasite antibody pattern and shows that protective immunity can be observed with appropriate antibodies. Malaria transmission remains in both study sites.

References

Acknowledgment
This work will be supported through the DELTAS Africa Initiative (GRANT # DEL-15-010). The DELTAS Africa Initiative is an independent funding scheme of the African Academy of Sciences (AAS)'s Alliance for Accelerating Excellence in Science in Africa (AESA) and supported by the New Partnership for Africa's Development Planning and Coordinating Agency (NEPAD Agency) with funding from the Wellcome Trust (GRANT # DEL-15-010) and the UK government. The views expressed in this publication are those of the author(s) and not necessarily those of AAS, NEPAD Agency, Wellcome Trust or the UK government.

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