Malaria prevention with nutrient supplementation in addition to seasonal chemoprevention in children aged 6-59 months in rural Mali

Anne THOMAS¹, Mahamadou DOUTCHI², Abdelkader ISSALEY³, Issa KANTA⁴, Maguy DAURES¹, Ali OUATTARA³, Susan SHEPHERD³, Renaud BECQUET¹

INTRODUCTION

- In Mali, in children <5 years old: mortality rate estimated at 115 per 1,000 live births, 20-24% of these deaths caused by malaria (2015 estimate, World Health Statistics, 2016)
- Prevalence of moderate acute malnutrition (MAM) and severe acute malnutrition (SAM) in children <5 years old in 2016, measured by weight-for-height Z-score: 8.6% [7.6–9.7] and 2.1% [1.7–2.5], respectively (Mali SMART survey, 2016)
- Malaria and malnutrition: complex link and similar seasonality in Mali
- No published large-scale trials on impact of seasonal malaria chemoprevention (SMC) / lipid-based nutrient supplement (LNS) joint distribution in sub-Saharan Africa

METHOD

Study design
- A paired cluster cohort study carried out between August and November 2016 in 18 rural health areas of Kolokani Circle, Koulikoro region, Mali
- Health areas matched by estimated under-five year child population in 2016 and their geographic localization in Kolokani Circle (north or south)

Population
- Children aged 6-59 months participating in community-based SMC distribution sessions

Outcomes
- Primary outcome: occurrence of malaria episodes defined by a positive rapid diagnostic test (RDT), detected from the 2nd through the 4th round
- Secondary outcome: occurrence of a repeated malaria episode in the 3rd or 4th round among children who have had a first malaria episode in the 2nd or 3rd round

RESULTS

- Number of children recorded in database: 38,452
- Number of children aged 6-59 months in 18 health areas involved in the study: 36,717

No association between the intervention and the occurrence of malaria episodes

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Nobs*</th>
<th>%**</th>
<th>aOR***</th>
<th>95% CI</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td></td>
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<tr>
<td>SMC</td>
<td>30,051</td>
<td>0.89</td>
<td>25,211</td>
<td>0.83</td>
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<td>SMC+LNS</td>
<td>9,242</td>
<td>7.08</td>
<td>17,298</td>
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</table>

* Total number of observations; ** Percentage of confirmed malaria episodes on total number of observations; *** odds ratio adjusted for sex, age, global acute malnutrition at the previous round, enrolment in nutritional program at current round, confirmed malaria at 1st round, round number, SMC distribution site, geographic localization

Association between the intervention and the occurrence of repeated malaria episodes

<table>
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<tr>
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</tr>
<tr>
<td>SMC</td>
<td>1,424</td>
<td>0.01</td>
<td>1,159</td>
<td>&lt;0.001</td>
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<tr>
<td>SMC+LNS</td>
<td>985</td>
<td>16.75</td>
<td>789</td>
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</tbody>
</table>

* Number of children who have had a confirmed malaria episode at 2nd or 3rd round; ** Percentage of children who have had a second confirmed malaria episode at 3rd or 4th round, among children who have had a first confirmed malaria episode at 2nd or 3rd round; *** odds ratio adjusted for sex, age, confirmed malaria at 1st round, SMC distribution site, geographic localization

CONCLUSION

- No impact of the intervention on the occurrence of malaria episodes but reduction of the risk of repeated malaria episodes
- First study on combined SMC/LNS distribution on a large scale
- Cooperation of national health and political actors, humanitarian NGOs and researchers
- Need for more robust studies including randomization, additional data on mosquito nets and LNS effective consumption, assessment of malaria cases at 4th round