RESEARCH BRIEF

Extended seasonal malaria chemoprevention: is it effective and acceptable in areas with longer rainy seasons in Ghana?

Key messages

Extending seasonal malaria chemoprevention (SMC) programmes from the usual 3 months to 5 months can significantly reduce the burden of malaria in areas with longer rainy seasons.

The benefit of SMC might be even greater if children were protected earlier, suggesting that 5 cycles may be insufficient in this setting and 7 or possibly 8 months of SMC should be explored.

Improving caregivers' understanding of preventive treatment, rather than just treating a child when they are ill, is a key factor governing the uptake of SMC.

Convenient access to SMC drugs, including door-to-door delivery by trusted community health workers (CHWs), makes SMC more acceptable to caregivers and leads to better adherence.

What is seasonal malaria chemoprevention?

SMC is an important tool in preventing new malaria cases and childhood death. It is an anti-malarial intervention that is very effective in areas with a short rainy season, where a large proportion of annual malaria cases occur within a few months of the year.[1] SMC involves giving monthly cycles of long-acting antimalarial drugs to all children aged under 5, regardless of whether or not they are infected. It is a policy recommended by the World Health Organization (WHO).[2]

Why Ghana?

While malaria is no longer the leading cause of child mortality in sub-Saharan Africa, it remains an important contributor. In Ghana, malaria accounts for 38% of all outpatient visits, 35% of all hospital admissions and 34% of deaths in children under 5 years of age.[3]

Why this study?

To date, SMC studies have mostly been carried out in places with a short rainy season. However, the effectiveness of giving SMC over an extended period in areas with a longer rainy season has not been fully evaluated. Our aim was to find out whether the basic approach used in SMC could be adapted to cover a longer period of risk. This would substantially increase the overall population that could be protected.

To explore these issues, we used:

1. a randomised controlled trial to estimate the protection provided by an extended SMC programme administered over a 5-month period, plus a short-acting artemisinin-based combination therapy (ACT) given to children who tested positive for malaria during the study; and
2. a qualitative study to investigate the community acceptability of an extended SMC programme and identify the key factors that encourage or discourage caregivers in the uptake of SMC for their children.

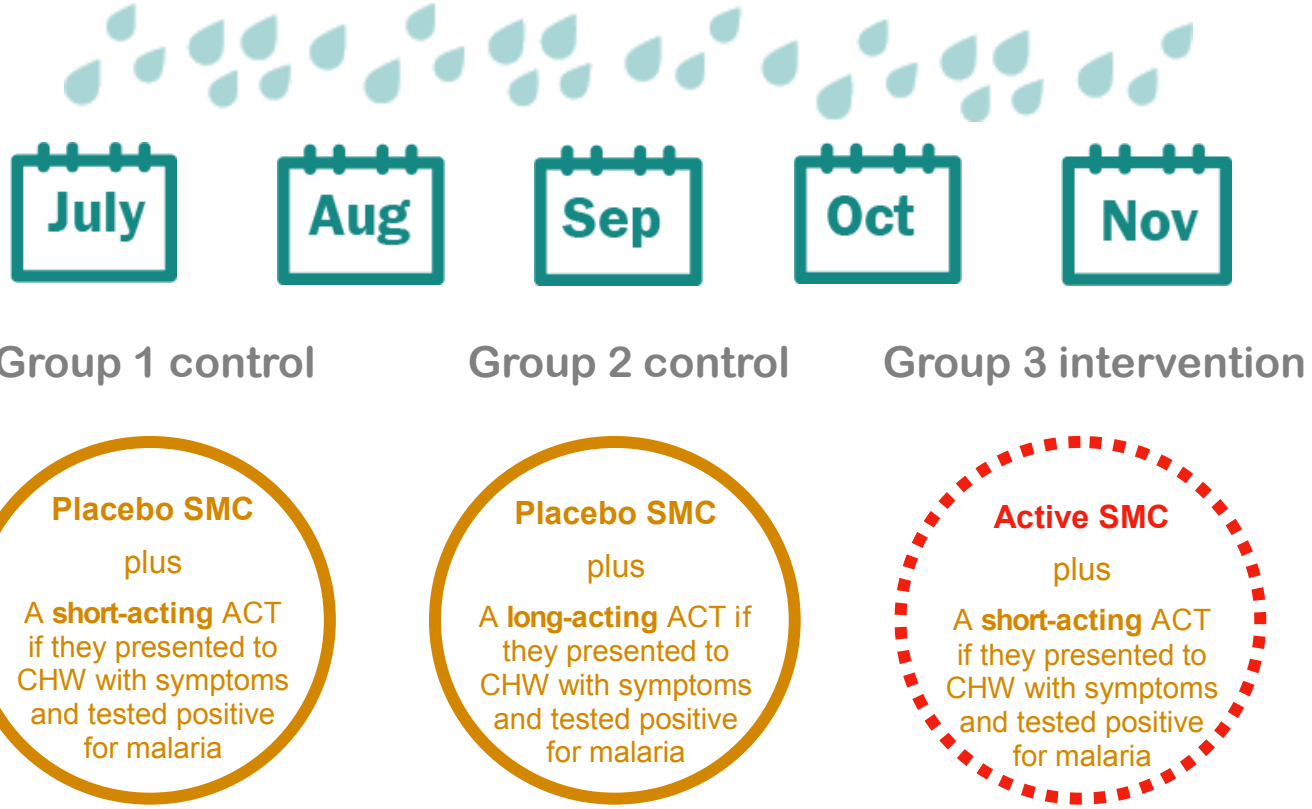
The study population

Our population was from the Kwaso sub-district in Ejisu-Juaben municipality. Here the rainy season begins in May and lasts until October. Malaria transmission lags 1 month behind, peaking in June to July and lasting until November.

We enrolled 2,400 children between the ages of 3 and 59 months (just under 5 years old) who were divided evenly into 3 randomised intervention groups. Figure 1 shows the intervention received by each group and how the SMC drugs or placebo were administered each month over the peak malaria transmission season.

Figure 1: Summary of SMC interventions received by each study group

SMC (active or placebo) administered in monthly cycles over 5 months between July and November 2012. One SMC cycle consisted of 3 doses given over 3 consecutive days.



Awareness before SMC and follow-up

In the days just before SMC was administered each month, CHWs and field supervisors reminded mothers and caregivers that SMC was due. Announcements were also made on local radio and by town criers. For the final 2 cycles of SMC (months 4 and 5), CHWs followed up children whose caregivers did not attend the central point to receive their medication.

Children who reported illness or fever at the time of SMC administration were screened with a rapid diagnostic test and, if positive, treated with either a short-acting or long-acting antimalarial therapy according to their research group.

A mother gives her child the first dose of SMC observed by a trained member of the study team

Key results from our randomised controlled trial

50% reduction in malaria prevalence

SMC administered during the peak of the malaria transmission season reduced the prevalence of asymptomatic malaria by around 50% in the group who received all the active doses for the full 5 months. This is lower than we expected with monthly SMC, but it still represents an important public health impact.

5 cycles of SMC may not be enough

The timing of the first cycle may have been too late for optimum protection. In July 2012, malaria prevalence was 26% indicating that the malaria transmission season was well underway. The benefit of SMC would probably be greater if children were protected earlier, suggesting that 5 cycles of SMC may be insufficient in this setting. More cycles, 7 or possibly 8, may be needed but this raises new questions about cost, safety and acceptability.

Home delivery of SMC may be best

There was decreasing uptake of SMC at the 2nd and 3rd cycles, with the lowest uptake in the 3rd. However, active follow-up by CHWs in cycles 4 and 5 for caregivers who did not attend the central point to receive their medication, achieved increased coverage. This suggests that door-to-door delivery and home supervision are needed for optimum uptake and coverage.

How acceptable is extended SMC to communities? Our key findings

We ran a qualitative study after the 5th and final dose of SMC had been administered. 6 main themes emerged as potential barriers and facilitators to SMC uptake:

1. Knowledge of malaria and its causes.
2. Perceptions about the health effects of SMC.
3. Poor understanding of prevention.
4. Trust in medical professionals and government.
5. Challenges of the medication regimen.
6. Convenient and flexible access to medications.

1 Knowledge of malaria and its causes

Knowledge of malaria and its causes varied widely among participants. However, caregivers were aware of their heightened risk of malaria during the rainy season and, when asked about groups more at risk, all participants said ‘children’.

Yet even among caregivers who were aware of malaria’s true cause and were specifically aware of children’s vulnerability, uptake of SMC remained varied. This suggests malaria-related health education may not always improve uptake of SMC.

2 Perceptions of health effects of SMC

Caregivers with optimal uptake reported positive health effects of SMC on their children, including no malaria, fewer headaches, no sickness and no diarrhoea. Some said this motivated them to continue with the SMC medication.

Caregivers who took fewer than 4 monthly doses of SMC also noticed positive health effects for their children, including no or fewer episodes of malaria and regained strength.

Despite this, they had sub-optimal uptake, suggesting other factors were influencing their decisions to continue with SMC. Some caregivers reported negative health effects of SMC but said they continued treatment after encouragement from family and CHWs.

'His urine was very yellow so I went to see my grandfather and he asked me to keep on giving him the drug and the sickness will go. And when I continued giving him the drug I did not see anything again.'

3 Poor understanding of prevention

Caregivers found the concept of chemoprevention difficult to understand, despite experience of intermittent preventive treatment for malaria during pregnancy (IPTp). Most caregivers needed a detailed explanation of the concept of 'protection' as opposed to 'treatment'.

Other routine practices outside of our study had accustomed caregivers to expect a diagnostic blood test before receiving any malaria treatment. Blood tests were carried out on participating children at the very start of our trial before the first dose of SMC, but not before subsequent doses. Without the blood tests, CHWs found it difficult to explain to caregivers why children should take the SMC mediation even though they were not sick. This may have been a barrier to uptake.

'In my opinion, if the child does not have the malaria parasites and takes the [SMC] medicine, it will bring problems to the child.'

4 Trust in professionals and government

Caregivers demonstrated a high level of trust in medics, CHWs and the government. Despite sometimes poor understanding of the purpose of SMC, many caregivers learned to trust the programme through talking and listening to others.

This suggests that a national SMC programme should draw on the testimonies of caregivers in this trial, and should be explicitly sanctioned by government.

'They have come to believe in the medicine so much...those who were not part are now very serious and want to join in'

5 Challenges of the regimen

CHWs estimated that between 10 - 20% of caregivers had not given the day 2 and day 3 doses to their children. This suggests a 3-day regimen may have been too challenging for some caregivers.

CHWs reported that announcements in the community asking caregivers to collect medication were not as effective as they could have been. Also, some caregivers were away from home at the time of drug deliveries, further hampering uptake.

6 Convenient access to medications

Caregivers whose children had optimal uptake identified community gatherings and home delivery as their preferred methods of SMC administration. These were the preferred choices of some caregivers with sub-optimal uptake too. Caregivers appreciated the local and family-focused home delivery offered by CHWs.

References:

1. Wilson A L. (2011) A systematic review and meta-analysis of the efficacy and safety of intermittent preventive treatment of malaria in children (IPTc). PLoS ONE. 6(2). doi.org/10.1371/journal.pone.0016976
2. World Health Organization (2012) WHO policy recommendation: Seasonal malaria chemoprevention (SMC) for plasmodium falciparum malaria control in highly seasonal transmission areas of the Sahel sub-region in Africa. Geneva, WHO
3. National Malaria Control Program (2010) 2010 Annual Report. Accra, NMCP

See our full research papers

- READ: Seasonal malaria chemoprevention in an area of extended seasonal transmission on Ashanti, Ghana
- READ: Facilitators and barriers to uptake of an extended seasonal malaria chemoprevention programme in Ghana: a qualitative study of caregivers and community health workers
- WATCH our short film on SMC in Ghana on YouTube

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