WHO Global Malaria Programme

WHO Policy Recommendation: Seasonal Malaria Chemoprevention (SMC) for *Plasmodium falciparum* malaria control in highly seasonal transmission areas of the Sahel sub-region in Africa

March 2012

Background

Malaria remains a leading cause of ill health, causing an estimated 216 million cases of clinical malaria and 655 thousand deaths in 2010[a]. More than 85% of malaria cases and 90% of malaria deaths occur in Africa south of the Sahara, here the vast majority of cases and deaths occur in young children.

Across the Sahel sub-region most childhood malaria mortality and morbidity occurs during the rainy season, which is generally short. Giving effective malaria treatment at intervals during this period has been shown to prevent illness and death from malaria in children.

Key interventions currently recommended by WHO for the control of malaria are the use of insecticide treated nets (ITNs) and/or indoor residual spraying (IRS) for vector control, and prompt access to diagnostic testing of suspected malaria and treatment of confirmed cases. Additional interventions which are recommended in areas of high transmission for specific high risk groups include Intermittent Preventive Treatment in pregnancy (IPTp), and Intermittent Preventive Treatment in infancy (IPTi).

With the changing epidemiology of malaria, there is a progressive paradigm shift from a "one size fits all" approach, to the targeting of malaria control strategies to specific populations and/or locations for maximal effectiveness. In keeping with this approach, WHO is now recommending a new intervention against *Plasmodium falciparum* malaria: Seasonal Malaria Chemoprevention (SMC). This intervention has been shown to be effective, cost-effective, safe, and feasible for the prevention of malaria among children less than 5 years of age in areas with highly seasonal malaria transmission.

Seasonal malaria chemoprevention[b] (SMC), previously referred to as Intermittent Preventive Treatment in children (IPTc), is defined as the intermittent administration of full treatment courses of an antimalarial medicine during the malaria season to prevent malarial illness with the objective of maintaining therapeutic antimalarial drug concentrations in the blood throughout the period of greatest malarial risk.

[a] World Malaria Report 2011. Geneva, World Health Organization, 2011 (ISBN 978 92 4 156440 1) http://www.who.int/malaria/world_malaria_report_2011/9789241564403_eng.pdf

[b] The word chemoprevention is used in SMC because the intervention comprises the administration of full curative treatment courses as opposed to chemoprophylaxis, which usually involves administration of sub-therapeutic doses.

The recommendation for SMC [c]

WHO recommends

- Seasonal Malaria Chemoprevention (SMC) is recommended in areas of highly seasonal malaria transmission across the Sahel sub-region[1]. A complete treatment course of amodiaquine plus sulfadoxine-pyrimethamine (AQ+SP) should be given to children aged between 3 and 59 months at monthly intervals, beginning at the start of the transmission season, to a maximum of four doses during the malaria transmission season (provided both drugs retain sufficient antimalarial efficacy).
- The age-based recommended dosing schedule is:

  Infants < 12 months old: AQ – half (½) of a 153mg tablet given once daily for three days and a single dose of SP - half of a 500/25mg tablet.

  Children 12 – 59 months: AQ – a full tablet of 153 mg given once daily for three days and a single dose of SP - a full tablet of 500/25mg.

  The single dose of SP is given only on the first day together with the 1st dose of AQ.
- Target areas[2] for implementation are areas where:
  - Malaria transmission and the majority of clinical malaria cases occur during a short period of about four months[3].
  - the clinical attack rate of malaria is greater than 0.1 attack per transmission season in the target age group, and
  - AQ+SP remains efficacious (>90% efficacy)[4].
- SMC Contraindications:

SMC should not be given to -

- A child with severe acute illness or unable to take oral medication
- An HIV-positive child receiving co-trimoxazole.
- A child who has received a dose of either AQ or SP drug during the past month.
- A child who is allergic to either drug (AQ or SP).

1. SMC with AQ plus SP is not currently recommended for countries in southern and eastern Africa, even though there are some locations where the transmission pattern would suggest suitability, because of the high level of *P. falciparum* resistance to AQ and/or SP, and the absence of adequate efficacy and safety data for other potential anti-malarial regimens for use in SMC.
2. Note that in some countries, the eligibility for SMC deployment might apply only to part of their malaria endemic area.
3. Areas where on average more than 60% of clinical malaria cases occur within a maximum of 4 months; these areas are characterized by more than 60% of the average annual rainfall falling within 3 months.
4. Based originally on therapeutic efficacy assessments of AQ+SP in children under 5 years of age using the WHO therapeutic efficacy testing protocol. Methods to assess continued SMC efficacy will be developed.

[c] The recommendation was made at the consultative meeting of the Technical Expert Group (TEG) of Preventive Chemotherapy, GMP, WHO, May 2011
http://www.who.int/malaria/publications/atoz/smc_report_teg_meetingmay2011.pdf
and was subsequently reviewed and endorsed by WHO's Malaria Policy Committee (MPAC), in January 2012
http://www.who.int/malaria/mpac/feb2012/mpac_article_03_2012.pdf

Other Considerations for deployment of SMC

- While there are several potential approaches to implementing SMC, there is presently insufficient evidence to recommend a standard deployment strategy and individual approaches best suited to local conditions should be used. However, if possible, its delivery should be integrated into existing programmes, such as Community Case Management and other Community Health Workers schemes.

- For maximum protection, and to minimize selection of drug resistance, children should receive preventive treatments each month during the transmission period, and should comply with the complete 3-day treatment course each month.

- In areas where SMC is deployed:

    1. Pharmacovigilance should be strengthened where it exists, and where it does not, it should be instituted.
    2. Drug resistance monitoring and system evaluation should be supported or instituted, including systems to assess the number of breakthrough infections and their intervals from the last dose of SMC.
    3. The health system needs to record and monitor AQ+SP doses administered in order to evaluate the impact of the intervention. Existing systems to document severe malaria, malaria deaths, and record confirmed cases of malaria should be strengthened.

- Treatment of breakthrough *Plasmodium falciparum* infections during the period of SMC should not include either AQ or SP or combination drugs containing either of these medicines, such as AS+AQ. In areas where SMC is implemented, alternative antimalarial combinations containing neither AQ nor SP must be made available for the treatment of clinical malaria in the target age group.

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- Intermittent Preventive Treatment with SP in infancy (IPTi) and SMC should not be administered concomitantly. Therefore in target areas for SMC, IPTi should not be deployed.

Based on clinical trial data, a high level of protection against uncomplicated clinical malaria is likely to be maintained for four weeks after the administration of each treatment course with AQ+SP; thereafter protection appears to decay rapidly.

Expected benefits

The recommendation is based on results from 7 studies on SMC (IPTc) conducted in areas of highly seasonal transmission of malaria. The evidence suggests that SMC using AQ+SP monthly for up to 4 months during the transmission season in children less than 5 years of age:

- Prevents approximately 75% of all malaria episodes
- Prevents approximately 75% of severe malaria episodes
- May result in a decrease in child mortality of around 1 in 1000
- Probably reduces the incidence of moderately severe anaemia
- Does not result in an increase in clinical malaria in the following malaria transmission season after one year of administration but the consequences of giving SMC for several years have not yet been evaluated.
- Serious adverse events have not been reported and are probably rare