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A strategic framework for malaria prevention and control during pregnancy in the African region

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Abstract

This paper is an appraisal of the WHO strategic framework on malaria prevention and control during pregnancy published in 2004.This WHO suggested three –prolonged approach including two doses of IPT with SP, the use of ITNs and case management of malaria.

As methodology used: after reading and understanding the WHO document on strategic framework on malaria prevention and control during pregnancy, we made short summary. Then we did a literature search to identify various relevant publications presented before and after the publication of this WHO document. An analysis on the formulation of the document, its effectiveness and applicability was done within this appraisal.

The conclusion insisted on the relevance of the proposed interventions within this WHO document, its implications on reducing maternal mortality and morbidity and future perspectives.

WHO document summary

A strategic framework for malaria prevention and control during pregnancy in the African region[1] is a guidance document that was published in 2004 as a collaborative effort of the Malaria Control Program and the Safe Motherhood Program of the WHO, Regional Office for Africa Congo Brazzaville and the Roll back Malaria and Making Pregnancy Safer teams of the WHO Headquarters. More than 90% of Malaria cases were occurring in Africa, affecting particularly pregnant women and their babies. Despite the gravity of the problem no proper malaria control programs were established in the past. The strategic framework was then developed to enable national policy makers and national malaria control programs to adopt and implement a policy that can reduce the burden of malaria on pregnancy in their countries.

The framework describes the clinical presentation of malaria on pregnancy and emphasize on the fact of being clinically silent in regions where malaria is endemic. In malaria endemic region placenta infection tends to be clinically silent and consequently undetected and untreated. That leads to various adverse consequences including maternal anemia and low birth weight babies. To address that problem, WHO developed a strategy aiming at reducing the number of maternal morbidity and mortality as well as to increase the number of babies born healthier.

Prior to this framework pregnant women in malaria endemic region were recommended to receive complete anti malaria treatment on their first antenatal clinic visit and receive weekly prophylaxis until delivery using chloroquine as the drug of choice, however this intervention was ineffective due to poor compliance ,resistance and side effects. To combat problems associated with malaria infection during pregnancy; this framework provided a new promising approach that combined three interventions: Intermittent Preventive Treatment (IPT) with Sulfadoxine -Pyrimethamine as the drug of choice, Insecticides -treated bed nets (ITNs) and effective management of malaria illness and anemia. It was then recommended through this framework to be adopted and be translated into action by various countries. The high rate of antenatal clinic visits by pregnant women in the African region of WHO and community based approach were the two pillars considered as gold opportunities for the success of the new policy implementation. The developed framework also provided various options to upgrade the proposed intervention particularly promoting research in the field of malaria on pregnancy.

List of abbreviations

1. ANC: Antenatal clinics
2. CHW: Community health worker
3. ITNs: Insecticides -treated bed nets
4. CQ: Chloroquine
5. IPT: Intermittent Preventive Treatment
6. LLINT: Long-lasting insecticides-treated bed Nets
7. MIP: Malaria in pregnancy
8. NMCP: National malaria control program
9. SP: Sulfadoxine- Pyrimethamine
10. WHO: World Health Organization

Literature search

The measure party of my literature search was done through the tools that were provided by the course on literature search. Journal article were accessed through Cochrane library and all Cochrane Library Database used. The Cochrane database of systematic reviews and Cochrane Central Register of Controlled Trials (MEDLINE and EMBASE) were mostly used to get access to various articles. Advanced search with Mesh system was also a tool to filtrate and get more specific articles. I was able to access some articles passing through Hinari to get various publications in Pub Med. I also had immediate access to some national papers with a direct search through Google. The malaria operational plan that has been endorsed by the U.S

Global Malaria Coordinator and reflects collaborative discussions with the national malaria control programs and partners in Rwanda was a rich source of information about the current situation in Rwanda.

Various researches have been published following the publication of the strategic framework on malaria and many efforts have been done in most African countries to find the best evident preventive and control options for malaria on pregnancy in their area. In Rwanda there is limited information about the burden of asymptomatic and clinical malaria, one of the recent studies done in Rwanda concluded that malaria is not the main determinant of law birth weight as in other African countries where malaria is endemic[2].However in this study author still recognize the vulnerability of women and their unborn babies to various severe adverse effects of malaria on pregnancy and recommends special attention to this particular group. Another study that was done in Rwanda in a region with law level of malaria transmission emphasized on the necessity of safe motherhood programmes in these regions, as malaria can cause large proportion of maternal death even in non endemic regions[3].

The initiation of the IPT is done in the second trimester of pregnancy; that is after quickening where the infection has a great chance to affect the baby but infection at the beginning of pregnancy may also have consequences. Though malaria prevention policies should be started early in pregnancy, especially by implementing the systematic use of insecticide-treated nets[4]. Monitoring and evaluation of malaria control in pregnancy is very essential for assessing the efficacy and effectiveness of health interventions aimed at reducing the major burden of malaria infection on women living in endemic areas[5]. In many African countries with high transmission settings of malaria, IPT has proved to reduce neonatal mortality[6] and clinical

researches have been very useful for the implementation of the new WHO MIP strategy over the classical chemoprophylaxis that was using CQ. In Burkina Faso, Intermittent preventive treatment with SP has shown clear superiority in reducing adverse outcomes at delivery, as compared to intermittent preventive treatment with classical prophylaxis with CQ[7]. These kinds of studies provided datas to various national malarial control programmes for an evidence-based policy change decision making process[8]. A cross Africa studies did not only prove the superiority of IPT with SP over Chroloquine but also other drugs have been tested, in Benin a study comparing SP over Mefloquine found Mefloquine to be highly effective both clinically and parasitologically for use as IPT. However, its low tolerability was an obstacle as it could impair its effectiveness though requires further investigations[9].

WHO document appraisal

Scope and purpose of the WHO document

The document was designed and published with clear objectives, it was created to encourage and enable the adoption of new efficient and effective intervention policy to control and prevent malaria during pregnancy. Statistics showing the high rate of women getting pregnant and various adverse effects in malaria endemic regions due to lack of effective preventive and control programs specifically described the question covered by the guideline.

Stakeholder involvement

The framework document resulted from a collaborative effort of the Malaria Control Program and the Safe Motherhood Program of the WHO, Regional Office for Africa and the Roll back Malaria and Making Pregnancy Safer teams of the WHO Headquarters. Various experts particularly those from Malaria endemic countries have contributed and a number of institutions provided technical support; among other institutions Center for Diseases Control and Prevention; Maternal and Neonatal Health Program of the Johns Hopkins Program for International Education in Gynecology and Obstetrics; London School of Tropical Medicine and Hygiene, Regional Center for Quality of Health Care; Bilateral Agencies (United States Agency for International Development); multilateral agencies (United National Children's Fund); networks (PREMA-EU) and others participated in the designing and publication of the framework. The new WHO intervention recommended in this publication was proposed with special consideration to lessons learnt with the existing inefficient programs at the time of publication. Factors like accessibility, affordability, side effects and compliance influenced the selection of the new intervention.

Individual countries Policy-makers, National Programs for Prevention and Control of Malaria and health workers have been targeted as the first users of the strategic framework on malaria prevention and control. At the time of publication the approach proposed in this publication was reflecting results of evidence based findings as it has been piloted in some African countries before recommending it.

Document development

A review by a team of expert including those from malaria endemic regions was done before publication, also successful experiences from country like Malawi which had a wide –scale IPT programming were considered. The promotion of ITNs was due to their documented evidences by various case control studies done in areas like Kenya where women using ITNs had less cases of low birth weight babies and prematurity in comparison with the non

protected with ITNs. However despite the clear criteria to select the evidence, emerging SP resistance in the southern Africa raised the need to evaluate other antimalaria drugs with regards to their efficacy and safety during pregnancy. The document clearly describes the process indicators, outcome indicators, impact indicators, research priorities and recommend approached that have been piloted and proved efficacy. The recommended approach was the most promising one with regards to health benefits, side effects and acceptability and was supported by evidence based findings. The recommended approach using IPTs with SP, ITNs and case control is clear and four areas to upgrade it through research prioritization were provided:

- Alternative drug regimens for intermittent preventive treatment.
- Programs options for achieving sustainable high levels of coverage of ITNs use by women of reproductive age.
- Efficacy of alternative IPT regimens combined with ITNs to control maternal anaemia and LBW.
- Analysis of social and cultural determinants of women using services to control malaria during pregnancy.

The strength of the WHO approach for the prevention and control of malaria was also supported by it applicability. The high prevalence of ANCs visits and collaboration between reproductive health programmes and malaria control programmes had a great hint to the success of the described policy.

Applicability

In Rwanda malaria in pregnancy strategy was based on WHO 'three –prolonged approach which include two doses of IPT with SP, the use of ITNs and case management of malaria as described by the framework. The approach was implemented in its entirely until 2008 when the NMCP decided to discontinue IPT. The decision to discontinue SP was primary driven by evidence from two studies, one of which showed high therapeutic failure of SP in 6-59 months old. A second study found no additional benefit of IPT with SP when compared to placebo in pregnant women. This together with the evidence of decreasing malaria transmission led the NMCP to revise their IPT strategy and discontinue IPT. As part of malaria in pregnancy intervention in Rwanda after IPT was stopped, NMCP uses specialized CHWs called Agent de Sante Matrnelle (ASM) who focus specifically on pregnant women in community and distribute folic acid, iron, Mbendazole to prevent anemia and promote LLIN use as well as early and regular ANC visits, community case management as well[10].

Conclusions

Since years ago malaria infection has been one of the measure contributors to both maternal and perinatal morbidity in Sub-Saharan Africa. Despite adverse consequence on both the mother and the fetus proper malaria control and prevention has been poor for years. This strategic framework was designed at needed time and provided most affordable and acceptable interventions. Many African countries adopted the framework and advanced researches have been done by various experts in malaria endemic regions where promising results confirming the efficacy of proposed control and prevention package with IPT, ITNs and effective management of malaria cases were published. Therefore there is a need to make a general assessment and revise the WHO current intervention with regards to emerging resistance on SP in some African countries.

References

1. WHO. A Strategic framework for malaria prevention and control during Pregnancy in the African Region. World Health Organization Regional Office for Africa, Brazzaville; 2004.

2. Rulisa S, Mens PF, Karema C, Schallig HD, Kaligirwa N, Vyankandondera J, de Vries PJ. Malaria has no effect on birth weight in Rwanda. Malar J. 2009 Aug 10;8:194.

3. Hammerich A, Campbell OM, Chandramohan D. Unstable malaria transmission and maternal mortality--experiences from Rwanda. Trop Med Int Health. 2002 Jul;7(7):573-6.

4. Cottrell G, Mary JY, Barro D, Cot M. The importance of the period of malarial infection during pregnancy on birth weight in tropical Africa. Am J Trop Med Hyg. 2007 May;76(5):849-54.

5. Brabin BJ, Warsame M, Uddenfeldt-Wort U, Dellicour S, Hill J, Gies S. Monitoring and evaluation of malaria in pregnancy - developing a rational basis for control. Malar J. 2008 Dec 11;7 Suppl 1:S6.

6. Menéndez C, Bardají A, Sigauque B, Sanz S, Aponte JJ, Mabunda S, Alonso PL. Malaria prevention with IPTp during pregnancy reduces neonatal mortality. PLoS One. 2010 Feb 26;5(2):e9438.

7. Tiono AB, Ouedraogo A, Bougouma EC, Diarra A, Konaté AT, Nébié I, Sirima SB. Placental malaria and low birth weight in pregnant women living in a rural area of Burkina Faso following the use of three preventive treatment regimens. Malar J. 2009 Oct 7;8:224.

8. Checchi F, Roddy P, Kamara S, Williams A, Morineau G, Wurie AR, Hora B, Lamotte N, Baerwaldt T, Heinzelmann A, Danks A, Pinoges L, Oloo A, Durand R, Ranford-Cartwright L, Smet M; Sierra Leone Antimalarial Efficacy Study Collaboration. Evidence basis for antimalarial policy change in Sierra Leone: five in vivo efficacy studies of chloroquine, sulphadoxine-pyrimethamine and amodiaquine. Trop Med Int Health. 2005 Feb;10(2):146-53.

9. Briand V, Bottero J, Noël H, Masse V, Cordel H, Guerra J, Kossou H, Fayomi B, Ayemonna P, Fievet N, Massougbodji A, Cot M. Intermittent treatment for the prevention of malaria during pregnancy in Benin: a randomized, open-label equivalence trial comparing sulfadoxine-pyrimethamine with mefloquine. J Infect Dis. 2009 Sep 15;200(6):991-1001.

10. President's malaria initiative. Malaria operational plan (mop). rwanda. fy 2010. Oct 19, 2009.