Community Case Management for Malaria Control-Understanding the Anti-Malaria Treatment Policy

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INTRODUCTION

WHAT IS MALRIA?

Malaria is a parasitic infectious disease caused by protozoan parasites of the genus Plasmodium and is transmitted by mosquitoes. It is characterized by recurrent symptoms of chills, fever and generalized body pain.

Malaria has afflicted the world's human population for thousands of years and continues to do so today. Malaria transmission occurs in 90 countries and territories between latitudes 45° N and 40° S. These countries have tropical or subtropical zones with optimal climatic conditions that favour the development of anopheline mosquitoes and malaria parasites (transmission of malaria across the placenta from mother to fetus is diagnosed when parasitaemia is found in the neonate within seven days of birth)

MODES OF TRANSMISSION

There are three main modes of malaria transmission:

1. The bite of an infected female anopheline mosquito (the main method of transmission);
2. Accidental transmission via blood transfusion or needle stick injury; and
3. Congenital transmission from mother to child during pregnancy or during birth.

The other modes of transmission via blood transfusion, accidental needle stick, or needle sharing, leads to transfer of asexual stages of the parasite. The incubation period of the disease is therefore much shorter than it is after transmission of sporozoites by mosquito bite.

According to the WHO Roll Back malaria initiative, Home is the first hospital.

> "Community-based health initiatives enable the 'home to be the first hospital'. They are the arms of our health systems that directly comfort the afflicted. They are the life- support systems of people who are poor, isolated and living in rural areas. In building upon the social organizations of communities, and on the informal and private health sectors, community-based health initiatives serve the direct interest of those most affected. The public sector health system, through support and stewardship, maximizes the potential of these partnerships so as to increase the effectiveness of community-based health initiatives. Community-based health initiatives complement the formal public health system, but do not replace it. Each enhances the activities of the other".
> Roll Back Malaria, WHO

INTEGRATED COMMUNITY CASE MANAGEMENT (ICCM)

Integrated Community Case management (iCCM) is an equity-focused strategy that aims to provide timely and effective treatment of malaria, pneumonia and diarrhea in areas with limited access to facility-based health care providers, especially for under five children. Community case management of malaria has been thought to be an effective strategy in early detection and treatment of uncomplicated Malaria. In June 2012, WHO and UNICEF issued a joint statement to support iCCM to improve access to essential treatment services for children.

To effectively implement community case management of Malaria understanding the antimalarial treatment policy is critical.

UNDERSTANDING ANTIMALARIAL TREATMENT POLICY FORMULATION

DEFINITION OF "ANTIMALARIAL TREATMENT POLICY" (ATP)

The **antimalarial treatment policy** (ATP) is a set of recommendations and regulations concerning antimalarial medicines and their utilization in the country. This policy is continuously evaluated, reviewed and updated whenever appropriate by the national malaria control programme.

PURPOSES OF THE ATP

The purpose of the ATP is to ensure the efficient use of the available resources to maximize the reduction in mortality and morbidity due to malaria. The specific objectives of an ATP are to:

1. Provide rapid and long-lasting cure for malaria patients;
2. Reduce morbidity, including malaria-related anemia;
3. Prevent the progression of uncomplicated malaria to severe and potentially fatal disease;
4. Reduce the transmission of the infection and infectious reservoir;
5. Minimize the emergence and spread of resistance to antimalarial medicine.

NOTE: **Morbidity** means the frequency or proportion with which a disease appears in a population, the number of people in a population who became ill on the other hand the **Mortality rate** or death rates is a measure of number of deaths in general due to a specific cause in a particular population scaled to the size of that population per unit of time.

KEY COMPONENTS OF THE ATP

A well-written ATP will usually contain information on:

1. Decision on whether a sick patient requires antimalarial treatment;
2. Recommended treatment for uncomplicated and for severe malaria; chemoprophylaxis for various risk groups;
3. Criteria for review of antimalarial treatment policy;
4. Regulation and deployment of antimalarial medicines

HOW AN ATP IS FORMULATED, MONITORED AND UPDATED

ATP should be formulated considering available information on malaria parasite medicine resistance in the country and on the currently recommended medicines and their roles in malaria management is crucial. The antimalarial medicines are then selected using the criteria below:

1. Efficacy and proven effectiveness against prevalent malaria species;
2. Safety;
3. Simplicity of dosage;
4. Cost effectiveness; and
5. Acceptability for consumers and prescribers.

For ATP to be updated there must be criteria to follow for a change of the policy, the main determinant of policy change is the therapeutic efficacy and the consequent effectiveness of the antimalarial in use. Other important determinants are; changing patterns of malaria-associated morbidity and mortality; consumer and provider dissatisfaction with current policy; and the availability of new products, strategies and approaches.

It is currently recommended that a review and change of the antimalarial treatment policy should be initiated when the cure rate with the current recommended medicine falls below 90% (as assessed through monitoring of therapeutic efficacy). However, a decision to change may be influenced by a number of factors, including;

1. The prevalence and geographical distribution of reported treatment failures, health service provider and/or patient dissatisfaction with the treatment,
2. The political and economic context, and
3. The availability of affordable alternatives to the commonly used medicine.

A new recommended antimalarial medicine adopted as policy should have an average cure rate ≥95% as assessed in clinical trials

The availability, acceptability and affordability of effective medicines to the consumer should also be monitored through: social research methods, focus groups to interviews, information can be obtained on consumers' use of antimalarial medicines, health-seeking behaviour, The impact of any possible change in policy also needs to be assessed using appropriate indicators in order to assist national policy-makers to review the policy.

Pharmacovigilance[1] system of monitoring should be used, appropriate surveillance systems should be set up for monitoring adverse medicine reactions.

1 The practice of monitoring the effects of medical drugs after they have been licensed for use, especially in order to identify and evaluate previously unreported adverse reactions. "the partnership hopes to develop diagnostic tools to improve pharmacovigilance"

NOTE:

Pharmacovigilence means the practice of monitoring the effects of medical drugs after they have been licensed for use, especially in order to identify and evaluate previously unreported adverse reaction. More data are needed on the newer medicines. There is also an urgent need to obtain more information on the safety profiles of antimalarials, in particular the ACTs, in pregnant women. WHO recommends that countries or regions should consider establishing pharmacovigilance systems if these are not already in place.

HOW THE ATP UTILIZES AVAILABLE SYSTEMS FOR QUALITY CONTROL AND QUALITY ASSURANCE OF ANTIMALARIAL MEDICINES

Quality assurance of malaria diagnosis and antimalarial medicines must be adhered to and this can be done using:

MICROSCOPY	RAPID DIAGNOSTIC TESTS	ANTIMALARIAL MEDICINES
Continuous monitoring and evaluation of individual laboratories and technicians should be established by means of a supervisory checklist. The quality of microscopes, the quality of reagents and training of staff in quality assurance in central and peripheral laboratories should be assured at national or subnational level. Technicians should be trained to detect malfunctioning microscopes and to use simple methods for maintenance. A quality assurance system requires a national reference laboratory or centre for setting standard operating procedures and providing training and reference materials. A functional quality assurance system requires adequate investment, which may be offset by improved cost–effectiveness of malaria diagnosis and improved confidence of health workers in the results of microscopy	Antigen-detecting rapid diagnostic tests (RDTs) are important for parasitological confirmation of a diagnosis of malaria when microscopy is not available. Quality assurance includes monitoring the technical standard of the tests, pre-purchase or post purchase testing of a sample of tests, training and supervision of users and control of storage and transport to minimize unfavorable environmental effects. Health workers should know how to manage negative results, as RDTs are not infallible, even when prepared and interpreted correctly. The preparation and interpretation of RDTs by health workers should be monitored three to six months after training, and remedial training should be given as required. During supervisory visits, interpretation of a set of prepared RDTs should be re-tested, and the preparation technique should be assessed; diagnosis and treatment records should be reviewed.	Good manufacturing practice is an aspect of quality assurance that ensures that products are consistently produced and controlled to the standards appropriate to their use and to the standards required by the medicine regulatory authority. Quality control is the part of good manufacturing practice that addresses operations and decisions about the quality of a product. In particular, quality control involves sampling, specifications, testing and documentation and procedures to ensure that the necessary tests are carried out, and that products are not released for use, sale or supply until their quality has been judged to be satisfactory. Simple test methods are available for quality assurance of pharmaceuticals under field conditions, for rapid detection of counterfeit and substandard pharmaceuticals. The world Health Organization (WHO) has consolidated the good manufacturing practices of various countries into standardized procedures, applicable to all manufacturers?

UNDERSTANDING TO USE EVIDENCE FOR DECISION – MAKING

Diagnosing malaria

According to 58 surveys conducted in 30 sub-Saharan African countries between 2010 and 2017, the percentage of children with a fever that received a diagnostic test in the public health sector has increased, hitting a median of 59% (IQR: 34–75%) over the period 2015– 2017, up from a median of 33% (IQR:18–44%) for 2010–2012.

Data collected from 56 surveys carried out in sub-Saharan Africa reveal that the percentage of febrile children attending public health facilities who received a malaria diagnostic test before antimalarial treatment has gone up from a median of 35% (IQR: 27–56%) in 2010–2012 to 74% (IQR: 51–81%) in 2015–2017. A similar increase has been recorded in the formal private health sector, from 41% (IQR: 17–67%) in 2010–2012 to 63% (IQR: 41–83%) in 2015–2017.

To bridge the treatment gap among children, WHO recommends the uptake of integrated community case management (iCCM). This approach promotes integrated management of common life-threatening conditions in children – malaria, pneumonia and diarrhea – at health facility and community levels. In 2017, of 21 African countries with high malaria burden, 20 had iCCM policies in place, of which 12 had started implementing those policies.

MANAGEMENT OF MALARIA

Understanding the basis of malaria and treatment

HEALTH EDUCATION

At all levels, from the hospital to the community, education is vital to optimizing antimalarial treatment. Clear guidelines in the language understood by the local users, posters, wall charts, educational videos and other teaching materials, public awareness campaigns, education of and provision of information materials to shopkeepers and other dispensers can all improve the understanding of malaria and the likelihood of improved prescribing and adherence, appropriate referral, and minimizing the unnecessary use of antimalarials. There is also a need for prescribers, shopkeepers and vendors to give a clear and comprehensive explanation to the patient or care on how to use the medicine.

Note: Concepts such as the community management of malaria should be explained to patients and caregivers during follow-up visits.

Who are most at risk of Malaria: Factors known to influence the severity of disease in a malaria infection include:-

1. The immunity of the individual, Adults who have lived all their life in an endemic area are less susceptible to severe disease than: – adults who visit an endemic area for the first time – young children living in the same endemic area;
2. Pregnancy, especially first and second pregnancies;
3. The availability and efficacy of antimalarial medicines(little information on the efficacy of the treatment);
4. The degree of parasite drug-resistance that prevails locally;
5. HIV/AIDS, especially in pregnant women;
6. Some genetically inherited conditions in the human host, e.g. sickle-cell trait, ß-thalassemia, and probably G6PD deficiency have a protective effect;

TREATMENT OF SEVERE MALARIA

The main objective of treatment is to prevent the patient from dying; secondary objectives are prevention of recurrence, transmission or emergence of resistance and prevention of disabilities. Special attention is required because severe falciparum malaria is a common cause of avoidable death and because correct early treatment and careful nursing can greatly improve the outcome. The following special measures are indicated:

1. Antimalarial medicines should be given parenterally if possible, under close supervision;
2. Treatment should be undertaken in hospital if possible;
3. Medicines that are ineffective and potentially dangerous should not be used.

Important to note: Under ideal conditions the severely ill patient, especially one who is exhausted, should be managed in an intensive care unit. Where this is not possible, as in most endemic areas, the health worker has to provide emergency care. Frontline health workers must be appropriately trained to a very high level to fulfill their essential role in patient management. Meticulous nursing care can be life-saving, especially for the unconscious patient.

Immediate Supportive Treatment

In severe malaria, the patient has a number of life-threatening complication(s) which can be fatal if not urgently treated. Some of the most urgent measures that will be required are to:

Control convulsions, assess the patient's fluid requirements, Reduce body temperature if greater than 39.5°C., and consider the need for blood transfusion

IN CLINICAL TERMS, MALARIA CAN BE CLASSIFIED IN TWO MAJOR FORMS: AS FOLLOWS:

UNCOMPLICATED MALARIA: This is symptomatic malaria with parasitaemia without signs of severity or evidence of vital organ dysfunction. Most cases of malaria in children in the tropics are of this type. The main manifestations of uncomplicated malaria include fever, chills, rigors, headaches, and body pains. Others are malaise, nausea, vomiting, and joint weakness.

SEVERE MALARIA: This refers to acute P. falciparum malaria with signs of severity or evidence of vital organ dysfunction. A patient is regarded as having severe falciparum malaria if Clinical and laboratory features of severe malaria shows:

1. Impaired consciousness or unarousable coma
2. Prostration
3. Multiple convulsions
4. Deep breathing, respiratory distress
5. Circulatory collapse or shock
6. Clinical jaundice
7. Abnormal spontaneous bleeding
8. Pulmonary oedema (radiological)

KEY TO NOTE:

SPECIFIC ANTIMALARIAL TREATMENT

After rapid clinical assessment and confirmation of the diagnosis, appropriate and correct regimen of parenteral antimalarial medicines should be administered to patients with severe malaria without delay.

KEY POINTS

Severe malaria is a medical emergency requiring nursing, medical and laboratory staff to be alert at all times. Prompt action is especially important for high-risk groups such as young children and pregnant women. The management of the patient is as important as chemotherapy and here the nurse has a crucial role to play. Regular monitoring of the core temperature, respiration (rate and depth), blood pressure, level of consciousness and other vital signs is essential. These observations will make it possible to identify the late onset of important complications such as hypoglycaemia, metabolic acidosis, pulmonary oedema and shock. Urine output should be recorded. Laboratory measurements should include regular checks on PCV, Hb, glucose, urea or creatinine (also electrolytes and arterial blood gases when possible). A proportion of children who survive cerebral malaria have neurological sequelae which persist into the convalescent period. It is important to retest PCV and Hb one month after discharge, especially if the patient was anaemic.

MALARIA IN PREGNANCIES AND WHAT DOES IT MEAN FOR COMMUNITIES

Pregnant women living in areas of low or unstable malaria transmission have little or no immunity to malaria, and are at higher risk of developing severe malaria than are non-pregnant adults living in the same area. In these areas, malaria is a major cause of maternal anaemia, spontaneous abortion, stillbirth, premature delivery, low birth weight (birth weight < 2.5kg), neonatal death and maternal death.

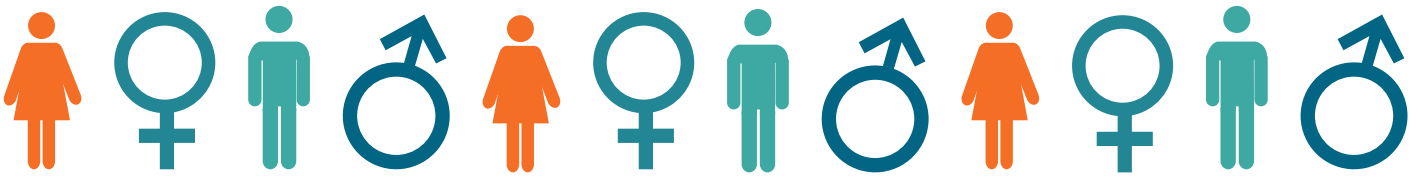
Important to note:

HIV infection impairs pregnant women's ability to control P. falciparum infection. Women with HIV infection are more likely to have symptomatic malaria infections and to have an increased risk of an adverse birth outcome due to malaria. In the presence of HIV infection, placental malaria appears to be independent of the number of pregnancies, so that the risk of placental malaria is similar in HIV-infected multigravidae and HIV-negative primagravidae.

TREATMENT OF UNCOMPLICATED MALARIA IN PREGNANCY	INTERMITTENT PREVENTIVE TREATMENT (IPT) OF MALARIA IN PREGNANCY	PREVENTIVE THERAPIES
Pregnant women with symptomatic acute malaria are a high-risk group, and require effective antimalarial medication Treatment of Severe Malaria in Pregnancy A pregnant woman with severe malaria should be given a parenteral antimalarial medicine in full doses without delay. Parenteral artesunate is more effective than parenteral quinine in reducing the risk of death from severe malaria. Although safety data on the use of artemisinins in the first trimester are limited, saving the mother's life is the primary objective, and both artesunate (IV or IM) and quinine (IV or IM) may be considered as options.	Intermittent preventive treatment during pregnancy (IPTp) is a strategy to prevent the consequences of malaria infections among pregnant women living in areas of moderate to high transmission of P. falciparum. IPTp involves the administration of a curative treatment dose of an effective antimalarial medicine at predefined intervals during pregnancy The benefits of IPTp include reduced incidence of malaria in pregnancy, reduced risk of malaria-related anaemia in pregnancy, and reduced rate of low birth weight.	To protect women in areas of moderate and high malaria transmission in Africa, WHO recommends "intermittent preventive treatment in pregnancy" (IPTp) with the antimalarial drug sulfadoxine-pyrimethamine.

Note: WHO recommends that all pregnant women at risk of falciparum infection in countries in sub-Saharan Africa with stable malaria transmission receive Intermittent preventive treatment (IPT) with SP during the scheduled ANC visit. The first dose should be administered as early as possible during the 2nd trimester of gestation (determined by the onset of "quickening" or by fundal height by ANC personnel). Each SP dose should be given at least 1 month apart and up to delivery."

In areas where > 10% of pregnant women are infected with HIV, a third dose should be given. As a policy, the medicines for IPT are taken under direct observation of treatment (DOT) during the Antenatal clinic (ANC) visit.

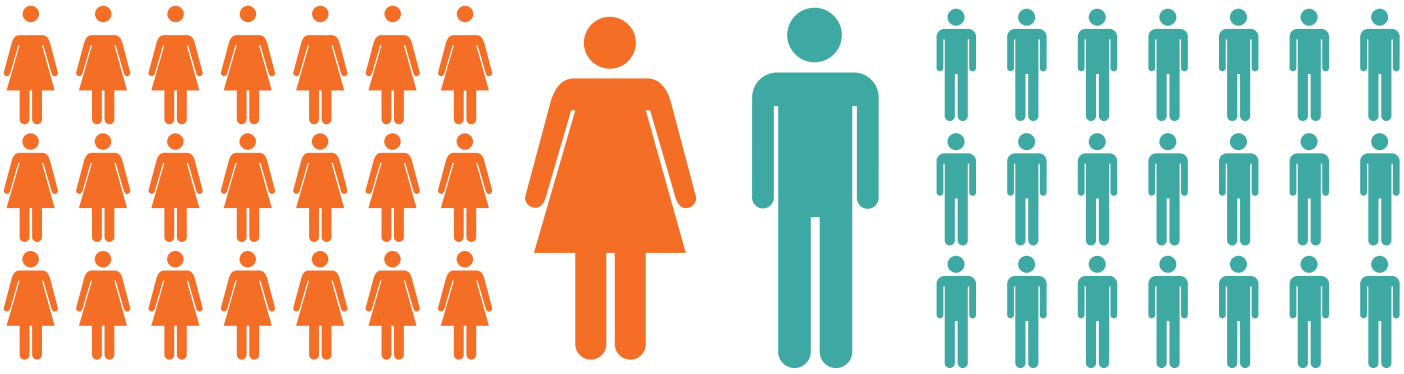


REFERENCES

WHO (2018). Available at:
https://www.who.int/malaria/publications/world-malaria-report-2018/report/en/
(Accessed on 25th April 2019)

USEFUL RESOURCE DOCUMENTS AND LINKS

WHO Available at
https://www.who.int/tdr/publications/documents/community_mgm_malaria.pdf
https://www.who.int/malaria/areas/community_case_management/en/



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