Short Communication

Indian Journal of Preventive Medicine
Volume 10 Number 1, January - June 2022
DOI: http://dx.doi.org/10.21088/ijpm.2321.5917.10122.3

Prevention of Malaria

Arvind Nath

How to cite this article:
Arvind Nath/Prevention of Malaria/Indian J Prev Med. 2022;10(1):23-25.

Introduction

The prevention of Malaria may be considered under two categories: personal preventive measures and local community measures. These are described in detail below:

Personal Preventive Measures [1]

Mosquito bite-prevention:

a. Avoid being outdoors between dusk and dawn.
b. Avoid outdoor activities in areas that are mosquito-breeding places such as swamps.
c. Wear clothing long enough to cover the arms and legs when going out at night.
d. Use mosquito repellant on revealed skin and clothing (especially socks and trousers)such as Diethyltoluamide (DEET) 100% spray or Diethyl Phenyl Acetamide (DEPA) 20% spray.
e. Treated clothing and other materials: insecticide-treated clothing is approved by the World Health Organization (WHO) as a form of personal protection and contains the active ingredient permethrin, which is a synthetic pyrethroid, at a dose of 1.25 g/ m2.
f. Use screened doors and windows. If these are not available, then the windows and doors must be shut at night.
g. Sleep under an insecticide-treated bed net. Make sure the edges are tucked under the mattress and that there are no holes in it.
h. Use anti-mosquito sprays and vaporizers that contain pyrethroids and coils and mats in rooms.

Chemoprophylaxis.[2]

a. When traveling to areas where Plasmodium vivax Malaria occurs, chemoprophylaxis with chloroquine can be used. In the case of weekly Chloroquine, the dose should begin one week before arrival. In the case of daily Chloroquine, the dose should begin one day before departure.
b. Dose: 5 mg of base/kilogram bodyweight weekly as one dose OR 10 mg of base/ kilogram bodyweight weekly in six daily divided doses. When traveling to areas where Plasmodium falciparum Malaria occurs, the chemoprophylaxis choices are Doxycycline and Mefloquine:
    i. Doxycycline must begin the day before arrival in the Malaria-risk area. Dose: 1.5 mg of salt/kg body weight daily.
    ii. Mefloquine should be started 3 weeks before departure to obtain higher pre-journey blood levels and to detect any neuropsychiatric symptoms so that alternatives can be prescribed. Dose: 5 mg/kg bodyweight weekly.

All drugs must be taken throughout the full duration of stay in the Malaria-risk area and continued for four weeks after leaving that area.

Author Affiliation: Scientist 'E', National Institute of Malaria Research, Dwarka, New Delhi 110077, India.

Corresponding Author: Arvind Nath, Scientist 'E', National Institute of Malaria Research, Dwarka, New Delhi 110077, India.

E-mail: natha.hq@icmr.gov.in

Received on: 16.02.2022

Accepted on: 16.03.2022

c. Special situations:

i. Pregnancy: Visits to affected areas should not take place unless necessary, especially during the first trimester. For visiting P. vivax-affected areas, Chloroquine use is safe in all trimesters. For P. falciparum-affected areas, Doxycycline may be given in the first trimester and Mefloquine in the second and third trimesters. Only if Doxycycline is not available should Mefloquine be given in the first trimester.

ii. Women in the reproductive age group: They should prevent pregnancy until three months after they have stopped Mefloquine prophylaxis and for 1 week after Doxycycline prophylaxis. Note: If pregnancy does occur during prophylaxis, it is not to be taken as an indication of medical termination.

iii. Young children: Infants and children should not be taken to areas with risk of P. falciparum Malaria. Mefloquine may be given to infants weighing more than 5 kg.

Local Community Measures

Vector Control: Through:

a. Indoor Residual Spraying (IRS):

Insecticides recommended by the WHO for IRS are in all 4 of the major insecticide categories (carbamates, organochlorines, organophosphates, and pyrethroids). The choice of insecticide used should be selected based on the susceptibility of the mosquitoes to the insecticide, human and environment safety, and cost-effectiveness.

b. Long-lasting insecticide-treated nets (LLIN):

Pyrethroids cause fast knockdown of susceptible mosquitoes and, because of their efficacy, safety, low cost, and excitorepellent effect, are currently the only insecticides recommended by WHO for use in LLIN.

c. Environmental management (EM):

There are 3 principal approaches to EM: (a) environmental modification, including permanent changes to land, water, or vegetation to reduce vector breeding; (b) environmental manipulation, which is usually a temporary and recurrent activity to produce unfavorable conditions for the vector; modification of human habitation or behavior to reduce vector contact. Prominent examples of EM include the permanent drainage of swamps to remove aquatic habitats suitable for mosquito larvae and the removal or covering of containers for container-breeding mosquitoes,

d. Biological control (BC):

Strictly speaking, BC involves the artificial introduction of predators, parasites, or pathogens into a target ecosystem to reduce vectorial capacity. Prominent examples of BC include the introduction of larvivorous fish species into aquatic mosquito larval habitats and the use of entomopathogenic fungi as a biological insecticide. Few BC intervention trials have demonstrated major effects on epidemiological outcomes; as a result, BC is usually considered as a synergistic tool to be used as part of a broader integrated vector management strategy.

Mass Drug Administration

Here, therapeutic doses of an effective antimalarial drug are given to an entire population irrespective of their Malaria-positivity status. By doing so, the reservoirs of the Malarial parasite i.e., the affected humans are effectively treated thereby reducing the number of those persons who could besources of infection to the female Anopheline mosquitoes.

Vaccination:

On 6th October 2021, the WHO recommended the use of the RTS, S/AS01 (RTS, S) vaccine as a preventive tool against Malaria for children living in sub-Saharan Africa and in also other regions having moderate to high P. falciparum Malaria transmission.[3] This was based on the findings of an ongoing program in Kenya, Ghana, and Malawi that has covered more than 800000 children since 2019.

The WHO recommended this vaccine in children aged at least 5 months in a three-dose schedule given one month apart followed by a fourth dose given 15-18 months after the third dose.[4]

References

1. American Public Health Association. Malaria. In Control of Communicable Diseases Manual 20th Edition, Washington D.C., U.S.A. 2016. Information as of 26 August 2021. Available at https://ccdm.aphapublications.org/doi/epdf/10.2105/CCDM.2745.097 Accessed on 11 February 2022.

2. World Health Organization. International Travel and Health. Situation as of 1 January 2012. Updates 2019. Geneva. Available athttps://www.who.int/publications/i/item/9789241580472 Accessed on 14 February 2022.
3. World Health Organization. 2021 News. Geneva. Available at https://www.who.int/news/item/06-10-2021-who-recommends-groundbreaking-malaria-vaccine-for-children-at-risk/Accessed on 13 October 2021.
4. Vandoolaeghe P. and Schuerman L. 2016. The RTS,S/AS01 malaria vaccine in children 5 to 17 months of age at first vaccination. Expert Rev. Vaccines2016 Dec;15(12):1481-1493.DOI: 10.1080/14760584.2016.1236689. Available at https://pubmed.ncbi.nlm.nih.gov/27841689/ Accessed on 13 October 2021.