EDITORIAL

Malaria Revisited

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Malaria is one of the major public health problems of the country. About 1.5 million laboratory confirmed cases of malaria are annually reported in India. Around 50% of the total malaria cases reported is due to P.falciparum. One of the reasons attributed to rise in proportion of P.falciparum cases is resistance to chloroquine, which was used for the long time as the first line of the treatment of malaria cases. P.falciparum infections are known to lead to severe malaria, if timely treatment with the effective drugs is not administered. Children under five years of age are one of most vulnerable groups affected by malaria. There were an estimated 660 000 malaria deaths around the world in 2010, of which approximately 86% were in children under five years of age (1, 2).

In high transmission areas, partial immunity to the disease is acquired during childhood. In such settings, the majority of malarial disease, and particularly severe disease with rapid progression to death, occurs in young children without acquired immunity. Severe anemia, hypoglycemia and cerebral malaria are features of severe malaria more commonly seen in children than in adults.

Early diagnosis and complete treatment is one of the key strategies of the National malaria control program. All fever cases clinically suspected of malaria should be investigated for confirmation of malaria either by microscopy or rapid diagnostic test (3-6).

The diagnostic procedures include counting of various stages of parasites by thin and thick blood films, PfHRP2 dipstick method, Plasmodium LDH dipstick/card test and Microtube concentration methods with acridine orange staining. The treatment regimens include as shown in *table no.1*

National Drug Policy on Malaria 2013

Effective treatment of malaria under the above policy aims at :

1. Early diagnosis and complete treatment
2. Prevention of progression of uncomplicated malaria into severe malaria and thereby reduce malaria mortality
3. Providing complete cure both clinical and parasitological of malaria cases
4. Prevention of relapses by administration of radical treatment
5. Interruption of transmission of malaria by use of Gametocytocidal drugs
6. Preventing development of drug resistance by rational treatment of malaria cases.

Policies on Treatment

1. It is stressed that all fever cases should be suspected of malaria after ruling out other common cause and should be investigated for confirmation of malaria by microscopy or rapid diagnostic kit so as to ensure treatment with full therapeutic doses with appropriate drug to all confirmed cases. From 2013 bivalent RDT (Rapid Diagnostic Kits) have been supplied under NVBDCP.

2. The malaria case management is very important for prevention of serious cases & death due to malaria.So,the private health care providers should also follow the common National Health Guidelines for treatment of malaria as per the drug policy 2013.

3. P.vivax cases should be treated with chloroquine for three days and primaquine for 14 days. Primaquine should be used to prevent relapse but is contraindicated in pregnant women ,infants and individuals with G6PD deficiency. People should report back in case they notice hematuria or high colored urine or cyanosis of lips and primaquine should be stopped in such cases and care should be taken in patients with anaemia.

4. P.falciparum cases should be treated with ACT (artesunate 3 days and sulfodoxine -pyrimethamine for 1 day) which is to be accompanied by single dose of primaquine preferably on day 2.

5. However, considering the reports of resistance to partner drug SP in North Eastern states, the Technical

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Table 1 . Various Treatment Regimens

1. Uncomplicated malaria : Known chloroquine sensitive strains of P.vivax, P.malariae, P.ovale, P.knowlesi and P.falciparum
   Chloroquine (10mg/kg of base stat followed by 5mg/kg at 12, 24 and 36 hours or by 10mg/kg at 24 hours and 5mg/kg at 48 hours)
   Or
   Amodiaquine 10-12 mg/kg qd for 3 days (1).
2. Radical treatment for P.vivax/ovale : Above regimen in addition to primaquine (0.5mg base/kg qd) for 14 days to prevent relapse. In mild G6 PD deficiency 0.75mg/kg once a week for 6 to 8 weeks. Primaquine is contraindicated in severe G6PD deficiency (1,4,7).
3. Sensitive to P.falciparum malaria : Artesunate 4mg/kg qd for 3 days + Sulfadoxine 25 mg/kg or pyrimethamine 1.25 mg/kg as a single dose.
   Or
   Artesunate 4 mg/kg qd for 3 days + Amodiaquine 10 mg/kg qd for 3 days (1).
4. Multi drug resistant P.falciparum : Artemether (1.5mg/kg) - Lumefantrine (9mg/kg) bd for 3 days along with food.
   Or
   Artesunate 4 mg/kg qd for 3 days + Mefloquine (25mg/kg) - either 8mg/kg qd for 3 days or 15 mg/kg on 2nd day and then 10 mg/kg on 3rd day. (8-10)
5. Second line treatment of imported malaria : Artesunate (2mg/kg qd for 7 days)
   Or
   Quinine 10 mg/kg tid for 7 days plus any one of the following:
   a) Tetracycline 4 mg/kg qd for 7 days.
   b) Doxycycline 3 mg/kg qd for 7 days.
   c) Clindamycin 10 mg/kg bid for 7 days.
   Or
   Atovaquone (20 mg/kg) - Proguanil (8mg/kg) qd for 3 days with food.
6. Severe P.falciparum malaria : Artesunate 2.4 mg/kg stat IV followed by 2.4 mg/kg at 12 and24 hours and then daily if necessary.
   Or
   Artemether 3.2 mg/kg stat IM followed by 1.6 mg/kg qd.
   Or
   Quinine dihydrochloride 20 mg/kg infused over 4 hours followed by 10 mg/kg infused over 2 to 4 hours, qd (1,8).
   Or
   Quinidine 10mg/kg of based infused over 1 to 2 hours followed by 1.2 mg of based/kg/ hour with ECG monitoring (1).
   When injectable treatment cannot be given, artesunate should be administered rectally and the child transferred to a facility for full parenteral treatment. A single dose of rectal artesunate as pre-referral treatment reduces the risk of death in children when the time for referral exceeds 6 hours.

Advisory committee has recommended to use the co-formulated tablet of Artemether (20mg)-Lumefantrine (120mg) i.e. ACT -AL as per the age specific dose schedule for treatment of Pf cases in North Eastern states. It is not recommended during first trimester of pregnancy and for children weighing less than 5kg.

6. Production and sale of Artemisinin monotherapy has been banned in India.

7. Thus, pregnant women with uncomplicated P.falciparum should be treated as Quinine in first trimester and ACT in second and third trimester.

8. In cases where parasitological diagnosis is not possible due to unavailability of microscopy or RDT, suspected malaria cases should be treated with full course of chloroquine, till the results of microscopy are received. Once the parasitological diagnosis is available, appropriate treatment as per the species, is to be administered.

9. Presumptive treatment with chloroquine is no more recommended.

10. Resistance should be suspected despite full treatment with no history of vomiting, diarrhoea, patient does not respond within 72 hours, clinically and parasitologically. Such cases not responding to ACT should be treated with oral Quinine with Tetracycline/ Doxycycline. These instances should be reported to concern District Malaria Officer/State Malaria Officer for initiation of therapeutic efficacy studies (6).

11. Doxycycline is contraindicated in pregnant women and children under 8 years of age.

12. CHW's (community health workers) play an important role in early diagnosis and prevention of severe cases of malaria by timely recognizing malaria as one of the common causes of fevers as they have been provided with rapid diagnostic kits under National Programme (6, 8, 9).

Pregnant women with severe malaria in any trimester can be treated with artemisinin derivatives, which, in contrast to quinine, do not risk aggravating hypoglycemia.Parenteral treatment should be given for at least 48 hours.Once the patient can take oral therapy give oral Quinine along with Doxycycline or Clindamycin in pregnant women and children less than 8 years of age, to complete 7 days of treatment, in patients started with parenteral Quinine.Full course of ACT to patients started on Artemisinin derivatives. Use of Mefloquine should be avoided in cerebral malaria cases due to neuropsychiatric complications associated with it (3,6). One should be careful in using corticosteroids.

Chemoprophylaxis should be administered only in selective groups in high P.falciparum endemic areas. Use of personal protection measures including Insecticide Treated bed Nets(ITN),Long Lasting Insecticidal Nets(LLIN) should be encouraged for pregnant women and other vulnerable population including travelers for long stay and even of Military and Para military forces posted in high endemic areas (6).

Short term prophylaxis (upto 6 weeks)-Doxycycline 100 mg once daily for adults and 1.5 mg /kg once daily for children more than 8 years of age. The drug should be started 2 days before travel and continued for 4 weeks after leaving the malarious area (4,6). Long term prophylaxis(more than 6 weeks)-Mefloquine 250 mg weekly for adults and should be administered 2 weeks before, during and 4 weeks after exposure (4,6).

Efforts are being made to produce an effective vaccine against malaria.SPF66, a vaccine against P.falciparum has been tested in S.America ,Africa and South East Asia and was partially found effective, but right now no vaccine is available for clinical use (9).

Malaria continues to be a public health threat in many developing countries especially for poor children in remote areas .This review aimed to look for evidence for the most effective approach to deliver malaria treatment in developing country like India by public and private sectors and by CHW' s (community health workers).Studies show that there is no shortcut to investment in training and supervision of providers and in treating malaria within a public health context rather than as a separate disease. CHW 's have proved to be effective link in providing correct diagnosis and treatment of malaria and other common fevers, even in remote areas. As per latest guidelines newer drugs need more clinical trials and socio-demographic and resistance patterns in different population.

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