Chapter 2

Indian Guidelines and Protocols: Malaria

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INTRODUCTION

Malaria is one of the major public health diseases of India. Nearly 1.5 million confirmed cases are reported annually by National Vector Borne Disease Control Program of which 50% are due to Plasmodium falciparum (PF). Chloroquine (CQ) resistant PF cases have been reported from various places of India and the world. The continuing use of CQ has been considered to be responsible for increasing proportion of PF cases. Prompt and effective treatment of uncomplicated PF cases will prevent cases from deterioration to severe cases and death. It also prevents transmission of drug resistance malaria. Effective treatment of severe cases of PF will reduce malaria-related death.

Because of the urgency to change the treatment of malaria worldwide, World Health Organization (WHO) has brought its first guideline in 2006 and later updated in 2010. Following this, National Drug Policy of treating malaria has been changed and updated in 2011. The present article has been based on the 2011 national recommendations for treatment of malaria in India.

TREATMENT OF UNCOMPROMICATED PLASMODIUM FALCIPARUM MALARIA

Artemisinin combination therapy (ACT) is the drug of choice for all confirmed cases of uncomplicated PF cases. This should be combined with primaquine (PQ) (0.75 mg/kg body weight or 45 mg) on day-2. There are several ACTs (Table 1). The ACT recommended in the National Program in India is artesunate (AS) + sulfadoxine and pyrimethamine (SP). Other ACTs (Table 1) can also be used. Oral AS monotherapy is banned in India.

TREATMENT OF UNCOMPROMICATED PLASMODIUM VIVAX MALARIA

Chloroquine is the drug of choice of Plasmodium vivax (PV) cases. It is given at a dose of 10 mg/kg (600 mg) on day-1 and day-2 and 300 mg on day-3.

Primaquine at a dose of 0.25 mg/kg (15 mg/day) for 14 days is to be added to prevent relapse. Primaquine is contraindicated in G6PD deficiency cases, infants and pregnant women.

- Treatment of mixed infection (PF + PV): Artemisinin combination therapy to be given with PQ as described earlier for treatment of PF malaria for India
- Treatment of uncomplicated PF cases in pregnancy: Quinine is the drug of choice in the first trimester, in a dose of 10 mg/kg for 8 hourly orally for 7 days. But, in the second and third trimester ACT is recommended
- Treatment of PV malaria in pregnancy: In all trimesters, CQ is the drug of choice
- Treatment of unconfirmed but suspected uncomplicated PF malaria cases: Chloroquine should be used as advised for treatment of PV malaria.

TREATMENT OF SEVERE PLASMODIUM FALCIPARUM CASES

Parenteral artemisinin derivative or quinine should be promptly given to prevent death. Intravenous (IV) preparations are preferred.

- Artesunate: It is the drug of choice. It should be given in a dose of 2.4 mg/kg IV on admission (0 hour), then at 12 hours and 24 hours and then once daily till the patient takes orally or for 7 days. Then, they should get full course of ACT for 3 days (Table 1). However, ACT containing MQ should be avoided in cerebral malaria due to possibility of development of neuropsychiatric complication
- Quinine: It is an acceptable alternative to AS. It should be given at a dose of 20 mg quinine salt/kg of body weight in 5% dextrose/ dextrose saline, over 4 hours, on admission. It is followed by 10 mg/kg of body weight 8 hourly infusions which should be started 8 hours after the 1st loading dose. The infusion rate should not exceed 5 mg/kg of body weight/hour. Initial loading dose should not be given if patient has already taken quinine. If quinine therapy is used beyond 48 hours, the dose should be reduced to 7 mg/kg of body weight 8 hourly till patient takes orally. Then, he should be given oral quinine in a dose of 10 mg/kg of body weight 8 hourly to complete 7 days of therapy. Quinine injection must not be given as bolus injection. It is always given in IV infusion. Doxycycline in a dose of 3 mg/kg of body weight per day for 7 days is to be added when the patient starts taking orally. Doxycycline is contraindicated in pregnancy and children below 8 years of age. In those cases, instead of doxycycline, clindamycin is to be given in a dose of 10 mg/kg of body weight 12 hourly for 7 days
- Arteether: It should be given in the dose of 3.2 mg/kg of body weight intramuscularly on admission and 1.6 mg/kg of body weight intramuscularly once per day for 4 more days. Then, ACT is to be given for 3 days (Table 1)
- Alpha-beta artemether: It should be given in a dose of 150 mg/day for 3 days intramuscularly. It is not recommended for children. It should be followed by ACT for 3 days (Table 1).

TREATMENT OF SEVERE MALARIA DUE TO PLASMODIUM VIVAX OR MIXED MALARIAL INFECTION

It should be treated as severe PF malaria cases.
TREATMENT OF SEVERE PLASMODIUM FALCIPARUM MALARIA CASES IN PREGNANCY

- **First trimester:** Parenteral quinine is the drug of choice. If it is not available, parenteral artemisinin derivatives can be given to save the life of the mother.
- **Second trimester and third trimester:** Parenteral artemisinin derivatives—AS is the drug of choice.

CHEMOPROPHYLAXIS

**Short-term Prophylaxis (< 6 Weeks)**

*Doxycycline: 100 mg/day (1.5 mg/kg of body weight per day)* to be started 2 days before and continued 4 weeks after leaving a malarial area. It is not recommended for pregnant and lactating women and children below 8 years of age.

**Long-term Prophylaxis (> 6 Weeks)**

*Mefloquine: 250 mg weekly (5 mg/kg of body weight/week)* to be started 2 weeks before going to the affected area and continued for 4 weeks after leaving the affected area. It is contraindicated in cases with history of convulsions, neuropsychiatric problems and cardiac conditions.

CONCLUSION

While CQ is the drug of choice for PV malaria, ACT is the drug of choice for uncomplicated PF and mixed cases of malaria. Parenteral AS is the drug of choice in severe PF and PV cases. Quinine is the acceptable alternative therapy. Doxycycline has been recommended for short-term prophylaxis and MQ for long-term prophylaxis. For first trimester pregnancy, quinine is the drug of choice. For second trimester and third trimester of pregnancy ACT is preferred in uncomplicated PF cases and parenteral AS in severe PF and PV cases.

REFERENCES