

Malaria in Children

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Dear editor,

Malaria is a major public health problem in developing countries in Africa, Asia, Central America and South America. About 40% to 50% of the world's population lives in malaria endemic areas (1, 2). Every year, approximately 300-500 million cases of malaria infections are occurred that cause 1-2 million deaths, mostly among young children. Children of all ages living in nonmalarious areas are equally susceptible to the malaria. But, in endemic areas, children under five years of age (mostly between six months and five years of age) are at the high risk of malaria infection than other groups. There were an estimated 660000 malaria deaths among children around the world in 2010, of which approximately 86% were cases under five years of age. In high transmission areas, partial immunity to malaria is acquired during childhood. In such areas the large number of malarias, and particularly severe forms with rapid progression to death, occurs among young children without acquired immunity to malaria. Severe anemia, hypoglycemia, and cerebral malaria are the features of severe malaria which is more commonly seen in children compared to the adults. Approximately 2.48 million cases with malaria are reported annually from South Asia of which 75% cases are from India (3). Children with malaria experience high fever which may be accompanied by chills, sweats, and headaches. The other common symptoms are abdominal pain, diarrhea, vomiting, weakness, myalgia, and pallor. In children, these symptoms are frequently misdiagnosed with a viral syndrome or acute gastroenteritis. Children, who are partially immune in endemic areas, frequently present the following presentations: hepatosplenomegaly, anemia, and jaundice. Children with suspected malaria should have parasitological confirmation of diagnosis before treatment. In children with malaria, hypoglycemia, impaired consciousness, respiratory distress, and jaundice are the risk factors for

death. Such patients should be treated as an urgent case (4, 5). *Plasmodium vivax* similar to *P. falciparum* is a causative agent of severe malaria in children (6). Many anti-malarials lack pediatric formulations, necessitating the division of adult tablets, which can lead to inaccurate dosing. It seems Artemisinin derivatives are safe and well tolerated by young children. Since the clinical condition of children younger than 5 years old with malaria can worsen rapidly, the use of parenteral treatment is a suitable route for pediatric treatment (4, 5). Recent findings support the use of intravenous artesunate in preference to quinine for the treatment of severe malaria in children. When injectable route cannot be given, artesunate must administer rectally and the child referred to a hospital for a full parenteral treatment. A single dose of rectal artesunate as prereferral treatment reduces the risk of death in children when the referral time is more than 6 hours (4). A second agent such as Clindamycin, Sulfadoxine-pyrimethamine, and Doxycycline (Not administered in children less than 8 years) or an effective agent against both malaria and bacterial infections (azithromycin) must be used in combination with the artemisinin compounds, or quinine (when artemisinin agent is not available) because when these drugs are used alone, high rates of parasite recrudescence are seen (7, 8). On the other hand, *Plasmodium vivax* and *Plasmodium ovale* have dormant liver stages and the treatment of an episode of malaria must include eradication of this stage. The classic treatment is a three-day course of chloroquine followed by a 14-day course of primaquine. Chloroquine also, is advised for treatment of infections caused by *P. falciparum* which is sensitive to this drug. World Health Organization (WHO) recommends the following protocols for the prevention and treatment of malaria in children (1):

1. Use of long lasting insecticidal nets

2. Seasonal malaria chemoprophylaxis for children aged between 3 and 59 months, in areas with highly seasonal transmission such as Sahel city located in sub-region of Africa.

3. Intermittent preventive therapy for infants in areas with moderate to high transmission rate in sub-Saharan Africa, except in the regions where WHO has recommended to administrate seasonal malaria chemoprophylaxis.

4. Prompt diagnosis and effective treatment of malaria infections

Although most clinical features in children are similar to those in adults, in severe disease the spectrum of clinical manifestations, complications and management is different. Therefore, it is necessary to design appropriate therapeutic guidelines for children which can be different in each country.

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References

1. World Health Organization . *Malaria in children under five*. 2010. Available from: http://www.who.int/malaria/areas/high_risk_groups/children/en/. Last.
2. Portugal S, Moebius J, Skinner J, Doumbo S, Doumtabe D, Kone Y, et al. Exposure-dependent control of malaria-induced inflammation in children. *PLoS Pathog*. 2014;**10**(4).
3. Kundu R, Ganguly N, Ghosh TK, Choudhury P, Shah RC. Diagnosis and management of malaria in children: recommendations and IAP plan of action. *Indian Pediatr*. 2005;**42**(11):1101-14.
4. World Health Assembly. *Global Fund to Fight AIDS, Tuberculosis and Malaria: the global malaria situation: current tools for prevention and control*. Available from: <http://apps.who.int/iris/handle/10665/78558>.
5. Sinclair D, Donegan S, Lalloo DG. Artesunate versus quinine for treating severe malaria. *Cochrane Database Syst Rev*. 2011.
6. Gehlawat VK, Arya V, Kaushik JS, Gathwala G. Clinical spectrum and treatment outcome of severe malaria caused by *Plasmodium vivax* in 18 children from northern India. *Pathog Glob Health*. 2013;**107**(4):210-4.
7. Gaubert A, Kauss T, Marchivie M, Ba BB, Lembege M, Fawaz F, et al. Preliminary pharmaceutical development of antimalarial-antibiotic cotherapy as a pre-referral paediatric treatment of fever in malaria endemic areas. *Int J Pharm*. 2014;**468**(1-2):55-63.
8. Stauffer W, Fischer PR. Diagnosis and treatment of malaria in children. *Clin Infect Dis*. 2003;**37**(10):1340-8.