New artemisinin-based treatment against malaria promising

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For some time now, artemisinin, derived from a Chinese herb, has been the most powerful treatment available against malaria. To avoid the malaria parasite becoming resistant, the World Health Organisation (WHO) strongly recommends combining artemisinin with another anti-malarial drug. But there are different formulations and derivatives, in different combinations and with dosing schemes. Scientists from the Institute of Tropical Medicine (ITM) carried out a head-to-head comparison of four combination therapies in seven African countries. One combination appeared particularly promising for regions where the risk of re-infection is high.

Malaria is caused by several related parasites, of which *Plasmodium falciparum* is the worst. The parasites have a complicated life cycle, partly in mosquitoes. When an infected mosquito bites a human, parasites are injected with the mosquito saliva into the blood, travel to the liver, where they change form, then infect red blood cells, where they further reproduce. After a few days (depending on the parasite species), the red blood cells burst to release a huge number of new parasites. These bursts cause intense fever, anaemia, renal problems. Each year, about 800 000 people die of malaria.

In recent years, the burden of malaria has declined substantially in several sub-Saharan African countries, due to large scale indoor residual spraying of insecticides, massive distribution of insecticide-treated bed nets, and the introduction of artemisinin-based combination treatments, ACTs for short. To treat patients with malaria the WHO advises each region to choose an ACT based on the local level of resistance to non-artemisinin medicine in the combination. But data on that resistance are scarce.

The ITM scientists, who also took part in the recent trials of the first effective malaria vaccine, compared four ACT treatments, in more than 4 000 randomised children less than 5 years of age with uncomplicated malaria, in twelve sites distributed in seven sub-Saharan African countries. This is the largest such study on ACT ever done in Africa. Three of the regimes had excellent and similar efficacy in treating the malaria attack, but of those, treatment with combination dihydroartemisinin-piperaquine (the combination most recent recommended by the WHO) resulted in significantly fewer recurrent infections. The development of resistance should be closely monitored, the scientists advise, but this new therapy clearly shows great promise.

More information: The Four Artemisinin-Based Combinations (4ABC) Study Group (2011) A Head-to-Head Comparison of Four Artemisinin-Based Combinations for Treating Uncomplicated Malaria in African Children: A Randomized Trial. PLoS Med 8(11): e1001119. doi:10.1371/journal.pmed.1001119

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