

Increased dosing of malaria drug in children could decrease risk of infection

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Credit: CDC

Piperaquine is a long-acting malaria drug that kills residual parasites and decreases the risk of reinfection. A study led by Uppsala University researcher Martin Bergstrand shows that increasing the dose used in children could potentially decrease the yearly incidence of malaria by 70 per cent.

The study was published yesterday in *Science Translational Medicine*.

The researchers developed a mathematical model to assess the relationship between piperazine concentrations in patient plasma and the risk among healthy males of acquiring a malaria infection. Piperazine concentrations of 6.7 ng/mL and 20 ng/mL were found to reduce the risk of acquiring a malaria infection by 50 per cent and 95 per cent, respectively.

Simulations were used to translate the results from the studied male population to a population of children. This showed that increasing the dose in children could potentially decrease the yearly incidence of malaria from 6 per cent to 2 per cent, during [preventive treatment](#) under certain conditions – a relative decrease of 70 per cent.

The modelling and simulation of vulnerable populations such as [children](#) and pregnant women is a valuable method, since actual dosing studies on these groups are difficult to perform.

The researchers also used mathematical models to investigate the consequence of a potential emerging resistance to piperazine. These simulations indicated that even moderate resistance to piperazine can be expected to drastically compromise the usefulness of piperazine in preventive therapy. A doubling of the piperazine concentration needed to reduce the risk of a [malaria infection](#) by 50 per cent would increase the yearly incidence from 2% to 10% under similar conditions. This emphasizes the need for a correct use of piperazine, in order to minimize the risk for development of widespread resistance.

More information: "Characterization of an in vivo concentration-effect relationship for piperazine in malaria chemoprevention." *Sci Transl Med* 29 October 2014: Vol. 6 no. 260 pp. 260ra147 [DOI: 10.1126/scitranslmed.3005311](#)

Provided by Uppsala University

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