

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 piperaquine concentrations in patient plasma and the risk among healthy males of acquiring a malaria infection. Piperaquine 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 <u>children</u> 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 piperaquine. These simulations indicated that even moderate resistance to piperaquine can be expected to drastically compromise the usefulness of piperaquine in preventive therapy. A doubling of the piperaquine 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 piperaquine, in order to minimize the risk for development of widespread resistance.

More information: "Characterization of an in vivo concentrationeffect relationship for piperaquine in malaria chemoprevention." *Sci Transl Med* 29 October 2014: Vol. 6 no. 260 pp. 260ra147 DOI: <u>10.1126/scitranslmed.3005311</u>



Provided by Uppsala University

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