Easy, inexpensive, efficient: Researchers improve efficacy of new malaria drug

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Artemisone is a promising substance in the fight against malaria. However, the active ingredient has yet to be used due its instability and because it is not easily absorbed by the body. A team from Martin

Luther University Halle-Wittenberg (MLU) and the Hebrew University of Jerusalem has now pushed this a bit further. They have developed a very simple method for preparing the active ingredient that makes it easier to administer and store. The researchers report on their work in the scientific journal *Antimicrobial Agents and Chemotherapy*.

Malaria is caused by single-celled parasites (plasmodia) and is one of the most widespread infectious diseases in the world. According to estimates by the World Health Organization (WHO), there were around 229 million cases of the disease worldwide in 2019, and 409,000 people died. Africa is the most severely affected region.

Laboratory tests have already shown artemisone's efficacy in combating the harmful parasites; however, it has not yet been put to use. "The substance is too unstable and cannot be easily absorbed by the body. Previous formulations have proven very costly to produce," says Professor Karsten Mäder, head of the Pharmaceutical Technology Group at MLU. His research group specializes in the design and production of drug carrier systems. It aims to prepare active ingredients is such a way that optimizes various properties, for instance efficacy, absorption in the human body, and stability of the substance. "We have developed a new formulation of artemisone in which the active ingredient is mixed with other substances. This is a very simple process that leads to a much more stable form. The process can be conducted in ordinary laboratories or factories," says Mäder.

The new substance was tested against severe malaria on an animal model at the Hebrew University. It was well absorbed by the body and was able to successfully fight off the parasites. A smaller amount than previous formulations was needed, which comes with an advantage: A lower dose means fewer side effects can be expected.

In an earlier study, the team was also able to show that the new

formulation of the drug is also very effective in treating schistosomiasis, a disease caused by flatworms. This disease is also widespread in the tropics.

Extensive clinical trials must be carried out before the active ingredient can be used as a medicine in humans. To this end, Mäder is in talks with several organizations that are committed to improving medical care in Africa.

More information: Johanna Zech et al, Efficient Treatment of Experimental Cerebral Malaria by an Artemisone-SMEDDS System: Impact of Application Route and Dosing Frequency, *Antimicrobial Agents and Chemotherapy* (2021). DOI: 10.1128/AAC.02106-20

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