Resistance to combination drugs threatens efforts to eradicate malaria

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Credit: AI-generated image (disclaimer)

With 300-500 million people falling ill to malaria each year, this debilitating tropical disease remains a global problem. Current combination drug therapy is still generally effective, but recent signs of resistance present scientists with a new challenge.

Malaria is major issue in Africa, in particular, where drug resistance in the 1990s contributed to a higher than usual death rate from the disease. However, Dr Henk Schallig from the Royal Tropical Institute in the Netherlands is hopeful this can be prevented from happening again.

This comes as results are emerging from the five-year MALACTRES project. Research has focused on multi-drug resistance in malaria under artemisinin-based combination therapy (ACT). The research team has assessed specific genetic markers and worked on innovative, rapid and simple diagnostics.

Dr Schallig explains: 'Many drugs to treat malaria are deemed to be ineffective, particularly in rural Africa. So there has been an urgent need for more affordable, safe and effective treatment alternatives. ACT is currently the mainstay of therapy. It is efficacious, but at risk due to emerging resistance. This is why we have developed sensitive tools for the prompt detection of malaria, and to tackle the growing resistance of parasites to existing anti-malaria drugs.'

The project has been able to investigate the existence of specific resistance genes associated with increased parasite transmission after treatment. Clinical trials have been supported by seven institutes across Europe and Africa which have helped to improve the diagnosis and treatment of malaria. They recently conducted ACT trials in Kenya and Burkina Faso and assessed the impact of various genes on parasite prevalence, longevity and transmission.

The MALACTRES research consortium has also developed molecular diagnostic assays based on polymerase chain reaction (PCR). PCR is a relatively cost-effective and simple method to quickly diagnose diseases, identify bacteria and viruses and carry out other forms of genetic identification. In this case it was used to detect all known parasite species directly from the blood of potentially infected individuals, via

field tests in Nigeria and Kenya. Tests have also been developed to identify and diagnose the presence of resistant malaria parasite strains, in particular Plasmodium falciparum.

Clinical studies have been a major part of this project, although Dr Schallig points out that there have been some challenges along the way: 'Climate change has delayed our studies, as in the case of Africa where changing weather patterns are affecting the rainy seasons, which makes it harder to predict when the transmission of malaria may occur. Now it is difficult to predict transmission patterns and people in East Africa are starting to complain that it is now too cold!'

Despite this complication, the MALACTRES study will significantly contribute to the long-term fight against malaria drug resistance by providing invaluable insight into candidate genetic markers implicated in the process. Although the project is due to end in the summer, the project team is hopeful of carrying on with their research using the knowledge already gained to continue the fight to eradicate malaria.

Dr Schallig says he is keen to keep the MALACTRES 'brand' going. The project aims to secure further funding to ensure that the tests become readily available and to further study the background of ACT resistance. 'The consortium is also committed to publishing our research findings, and a number of high-profile publications will appear once the project ends,' he concludes.

More information: MALACTRES www.malactres.eu

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