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Resurrected malaria strategy saves thousands of lives in Africa

Pre-emptively treating kids for malaria is working, despite logistical challenges.

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A healthworker in Mali prepares a dose of malaria chemoprevention.

In a sea of high-tech malaria fixes — everything from drug-delivery by drone to gene-edited mosquitoes — an old-fashioned approach is saving thousands of children in West Africa, according to studies presented this week at the American Society of Tropical Medicine and Hygiene (ASTMH) meeting in Baltimore, Maryland.

The measure, called seasonal malaria chemoprevention, involves giving children a dose of antimalarial drugs once each month in the rainy season to prevent the disease in hard-hit regions. Researchers have previously demonstrated this strategy in large clinical trials but they had feared that their positive results wouldn't be replicated in the messy, real world, because chemoprevention requires thousands of local health workers to deliver drugs to children in villages far from hospitals, pharmacies and paved roads.

"People were doubtful this intervention would work, because it's so demanding," says Brian Greenwood, an infectious disease specialist at the London School of Hygiene and Tropical Medicine who helped to conduct trials that showed reductions in malaria prevalence up to 84%[1]. As a result of those studies, more than 6.4 million children in nine countries in sub-Saharan Africa (Burkina Faso, Cameroon, Chad, Gambia, Guinea, Mali, Niger, Nigeria, Senegal) received the drugs in 2016.

It seems to be working, according to data presented at the ASTMH meeting. "They are seeing the same level of efficacy against malaria that we saw in clinical trials and reducing hospital admissions," says Greenwood. "I am very happy." But researchers are also finding signs that this approach may not work for long.

Data driven

Malaria researchers deployed chemoprevention in the 1950s, but it fell out of favour when the widespread use of malaria drugs led to drug resistance. Yet by 2000, more than 830,000 people were dying of the disease each year — mainly children in Africa — and there were no blockbuster vaccines on the horizon. So malariologists revisited the approach. Between 2002 and 2012, clinical trials conducted in West Africa suggested that combinations of older malaria drugs had the power to prevent 8.8 million cases and 80,000 deaths every year if implemented solely during the rainy season, when the disease spikes.

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Children in Mali receive a dose of malaria drugs, to reduce their risk of becoming infected with the disease.

In 2012, the World Health Organization recommended the strategy with three old drugs — sulphadoxine, pyrimethamine and amodiaquine — so that the only sure-fire cure for malaria, artemisinin, would remain effective. Alassane Dicko, a malariologist at the University of Bamako in Mali, says that he did not take the intervention for granted when it launched in Mali in 2013, because he knew that funds were limited and drug resistance inevitable. “Research is essential,” he says. His lab began assessing chemoprevention’s efficacy, cost and effects on drug resistance.

In August, Dicko and his colleagues reported[2] that malaria prevalence was reduced by 65% in children under age 5 who were treated with chemoprevention in the Malian district of Kita, compared to a similar number of children in a neighbouring district that lacked the funds to roll out the intervention.

Race against resistance

On the basis of results such as these, malaria researchers at the meeting estimate that chemoprevention has averted roughly 6 million cases and 40,000 deaths in 2015 and 2016 in the

countries where it is practised. “This intervention has been extremely well documented over three or four years,” says Erin Eckert, an epidemiologist at the US Agency for International Development’s President’s Malaria Initiative, based in Washington DC. As a result, the agency plans to help fund chemoprevention in eight countries next year.

Also at the ASTMH meeting, Dicko reported a 80-person trial showing that adding another old malaria drug, primaquine, to the regimen combo blocks the transfer of the malaria parasite, *Plasmodium falciparum*, from humans into mosquitoes. This would further reduce the amount of the parasite in circulation. Dicko aims to hit the disease hard and fast — with multiple drugs, as soon as possible — because he and his colleagues are already detecting genetic signs of drug resistance in parasites[3].

New chemoprevention drugs in the pipeline might not be ready before existing drugs fail because of resistance, Greenwood says. This year, he helped to launch a trial combining chemoprevention and a less effective malaria vaccine in Burkina Faso and Mali. The vaccine was previously shown to reduce the number of malaria cases by less than 36% in children[4], but Greenwood hopes the combined tools, together with bed nets, can suppress malaria enough to stop it from bouncing back once today’s drugs fail. By that time, he says, genetically engineered mosquitoes might be ready to fly.

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References

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