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Comparing the efficacy, tolerability and easy administration of dihydroarthemisinin, piperaquine, artesunate, sulfamethoxypyrazine and pyrimethamine against sulphadoxine-pyrimethamine for preventing malaria in children: A randomized phase III trial in Ghana

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Background: Intermittent preventive treatment for malaria in children (IPTc) is a promising intervention to reduce the burden of malaria in sub-Saharan Africa. Artemisinin-based combinations are judged the best treatments for multi-drug resistance *P. falciparum* malaria. Some of these combinations could also be used for IPTc if they have some prophylactic effect. We investigated the therapeutic efficacy, tolerability and ease of administration of dihydroarthemisinin plus piperaquine (DHA+PQ) and artesunate plus sulfamethoxypyrazine plus pyrimethamine (Co-Arinate) compared with SP in asymptomatic malaria children.

Methods: Five hundred and ninety (590) children aged 6 to 59 months with asymptomatic *P. falciparum* malaria were randomly allocated to the SP arm as single dose (n=150), Co-Arinate daily for three days (n=143), Co-Arinate 12-hourly for 24hours (n=149) and DHA+PQ daily for three days (n=148) arms. The children were followed up on post treatment days 1, 2, 3, 7, 14, 28, 42 and 63.

Results: Day 42 PCR-uncorrected parasitological failure rate was higher in the SP arm than in the Co-Arinate daily, Co-Arinate 12-hourly and DHA+PQ arms [40.0% vs. 26.6%; RR 0.7; 95% CI: 0.54, 0.95; p= 0.015], [40 vs. 34.9%; RR 0.9; 95% CI: 0.70, 1.14; p=0.362] and [40% vs. 16.2% RR 0.5; 95% CI: 0.35, 0.70; p<0.000]. The difference was statistically significant in the Co-Arinate daily and DHA+PQ arms but not in the Co-Arinate 12-hourly arm. Co-Arinate daily reduced the incidence of malaria by 41.5% (95% CI: 15.3%, 59.5%; p=0.004), Co-Arinate 12-hourly by 10.3% (95% CI: -25.0%, 35.6%; p=0.521) and DHA+PQ by 61.1% (95% CI: 41.0%, 74.4%; p<0.000) compared to SP.

Interpretation: Three days dose regimens are safer, more efficacious and provide longer protection compared to single dose or divided doses administered within 24 hours. Therefore, DHA+PQ and Co-Arinate daily for three days can be used for IPTc in Ghana.

Biography

Margaret Kweku completed PhD in 2007 from the London School of Hygiene and Tropical Medicine (LSHTM) London UK. She is a senior Lecturer at the School of Public Health of the University of Health and Allied Sciences, Volta Region, Ho, Ghana. She has published more than 17 papers in reputed journals. She is currently involved in conduction field interventions trials and evaluation of health intervention programmes. She is also involved in drug and vaccine trials.

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