

The content of African diets is adequate to achieve optimal efficacy with fixed-dose artemether-lumefantrine: a review of the evidence

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Malaria Journal 2008, 7:244doi:10.1186/1475-2875-7-244

A fixed-dose combination of artemether-lumefantrine (AL, Coartem[®]) has shown high efficacy, good tolerability and cost-effectiveness in adults and children with uncomplicated malaria caused by *Plasmodium falciparum*. Lumefantrine bioavailability is enhanced by food, particularly fat.

As the fat content of sub-Saharan African meals is approximately a third that of Western countries, it raises the question of whether fat consumption by African patients is sufficient for good efficacy. Data from healthy volunteers have indicated that drinking 36 mL soya milk (containing only 1.2 g of fat) results in 90% of the lumefantrine absorption obtained with 500 mL milk (16 g fat). African diets are typically based on a carbohydrate staple (starchy root vegetables, fruit [plantain] or cereals) supplemented by soups, relishes and sauces derived from vegetables, pulses, nuts or fish. The most important sources of dietary fat in African countries are oil crops (e.g. peanuts, soya beans) and cooking oils as red palm, peanut, coconut and sesame oils. Total fat intake in the majority of sub-Saharan countries is estimated to be in the range 30–60 g/person/day across the whole population (average 43 g/person/day). Breast-feeding of infants up to two years of age is standard, with one study estimating a fat intake of 15–30 g fat/day from breast milk up to the age of 18 months. Weaning foods typically contain low levels of fat, and the transition from breast milk to complete weaning is associated with a marked reduction in dietary fat. Nevertheless, fat intake >10 g/day has been reported in young children post-weaning. A randomized trial in Uganda reported no difference in the efficacy of AL between patients receiving supervised meals with a fixed fat content (~23 g fat) or taking AL unsupervised, suggesting that fat intake at home was sufficient for optimal efficacy. Moreover, randomized trials in African children aged 5–59 months have shown similar high cure rates to those observed in older populations, indicating that food consumption is adequate post-weaning. In conclusion, it appears that only a very small amount of dietary fat is necessary to ensure optimal efficacy with AL and that the fat content of standard meals or breast milk in sub-Saharan Africa is adequate.